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CARIBOU CREEK

Major General Gilman C. Mudgett, *United States Army*
Deputy Commanding General, Sixth United States Army

SKI troopers and mechanized columns surged forward along three routes in the half light of early morning on 10 February 1959. They were headed north to a defensive line along Alaska's Kashwitna River. The 2d Airborne Battle Group, 503d Infantry, part of the Strategic Army Corp's (STRAC) 82d Airborne Division, had the mission of defending the Willow airfield against an expected attack by Aggressor. The Aggressor force, with Fairbanks in its hands after last year's "battle" north of the Alaska Range, was striking south to seize the vital base complex near Anchorage.

The Aggressor 50th Airborne Brigade, played by United States Army Alaska's 1st Battle Group, 23d Infantry, was strengthened with a nuclear surface-to-surface missile (*Honest John*) capability. Reinforced with tanks, engineers, transportation (*M59*), and self-propelled artillery, Aggressor had "seized" the Talkeetna area as the maneuver got under way.

To defend the Willow area, 2d Airborne Battle Group, 503d Infantry, moved north to establish the defense line near the Kashwitna, beyond Aggressor's surface-to-surface missile (SSM) range.

Exercise *Caribou Creek*, the Army's winter maneuver in Alaska this year, was under way.

Maneuver Locale

Selected as the site for the exercise was an 800-square mile area of the Susitna basin country, a region of forest and muskeg completely devoid of roads, between the Alaska Railroad and the rugged Talkeetna Mountains to the east with Talkeetna and Willow the northern and southern limits.

Heavy forests covering the low but steep sided moraine on the north formed a stockade like barrier to ground movement by Aggressor. To the south a succession of streams and a scarcity of landmarks combined with dense thickets of spruce, birch, and alder to make control and progress difficult.

As the maneuver began, thick fog prevented air activity. A sudden warm spell with temperatures rising to near freezing threatened to "drop the bottom out" of winter roads being cut through the muskeg. Both sides cheered as the mercury later plunged to about 20 below zero where it belonged. Clearing skies then allowed commanders to unlimber their air eyes and see where they were going.

United States Army, Alaska (USARAL) is assigned the mission of developing cold weather doctrine, teaching it at the Cold Weather and Mountain School at Fort Greely, and putting it to test in maneuvers. The lessons learned and the doctrine developed are for the entire Army and thus must apply to the pentomic organization of today.

Standard infantry or airborne battle groups, suitably reinforced for independent operations, constitute the maneuver

Exercise* Caribou Creek, *the Army's winter maneuver in Alaska, provided experience and training for participating units in a critical strategic area of the world in situations duplicating wartime conditions

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fighting units. This is important to note as it would be a simple matter to organize and equip a special force for operations in northern latitudes. This special organization would prove superior in many respects to our normal infantry or airborne units, but this is contrary to US Army policy which requires that the standard US type divisions must be capable of operating in the desert, the jungle, or in areas such as Alaska with the absolute minimum of modification.

Due to recent additions in the troop list of USARAL, *Caribou Creek* came closer to testing the ability of pentomic battle groups to move and fight in northern latitudes and conditions than any previous Alaskan maneuver. These additions included the standardized *M59* armored personnel carriers which proved capable of plunging through four feet of snow and breaking trails through the thick woods, and the *H-21* (*Shawnee*) helicopters that become the workhorses of the air for movement of men, equipment, and supplies. Mobility received a shot in the arm with the addition of these husky and dependable vehicles to USARAL during 1958. As the lighter tracked personnel carrier, such as the *T113* or *T116*, becomes available, over snow capability through the use of standardized equipment will again be enhanced.

Major General Gilman C. Mudgett was graduated from the United States Military Academy in 1922 and subsequently served with various cavalry units in this country and in the Philippines. He was graduated from the U. S. Army Command and General Staff College in 1938. He assumed command of the 2d Armored Regiment, 9th Armored Division, in 1942, and in 1944 was graduated from the Army and Navy Staff College. He participated in five campaigns in the European theater where he was with the Plans and Operations Branch of Headquarters, First US Army Group, and later Chief of the Liaison Branch and Operations Sub-Branch Section of Advance Headquarters, 12th Army Group. He became Chief of the Joint Staff of the Panama Canal Department in 1945, served as Director of the Plans and Operations Division of the Caribbean Command, was named Assistant Director of the Plans and Operations Division of the Armed Forces Staff College in June 1948, and the following April was appointed director. General Mudgett went to Korea in March 1951 to become Assistant Chief of Staff for Operations of Eighth Army, served on the staff of the United Nations Command military armistice delegation, and was Chairman of the Joint Psychological Committee of the Far East Command. He was assigned as Army Chief of Information in 1953 and in 1955 became Chief of Public Information, Office of the Secretary of the Army, and Chief of Information and Education, Office of the Chief of Staff. He commanded the 5th and 6th Infantry Divisions and Fort Ord, and in February 1957 became Commanding General, US Army, Alaska. In June 1959 General Mudgett assumed his present position as Deputy Commanding General, Sixth US Army.

Interesting Features

Many facets of this 1959 training exercise are of interest.

In preparation for the maneuver, selected officers and noncommissioned officers from 2d Airborne Battle Group, 503d Infantry, were flown to USARAL's Cold Weather and Mountain School at Fort Greely, for cold weather training. These men experienced a temperature drop of nearly *100 degrees* in the 48 hours following their departure from Fort Bragg, North Carolina. Every STRAC unit, at least, must be prepared to do the same, and some may be required to *commence operations upon arrival.*

The air movement of the 503d Battle Group from Fort Bragg to Fort Richardson, Alaska, was accomplished at a time when bad weather swept across the northern United States. Considerable re-routing and delay of aircraft occurred. On the arrival end, the main body *preceded* the advance party, providing a lesson in adjustment to unplanned situations.

The airborne battle group brought a minimum of gear with them and were "married" to equipment from USARAL

reserve stocks. USARAL units, including D Company, 40th Armor, 47th Transportation Company (*M59*), and 2d Platoon, 80th Transportation Company (Light Helicopter), were attached to the already reinforced airborne battle group. A period of training was conducted in the Fort Richardson area prior to movement of the US Force to the exercise area.

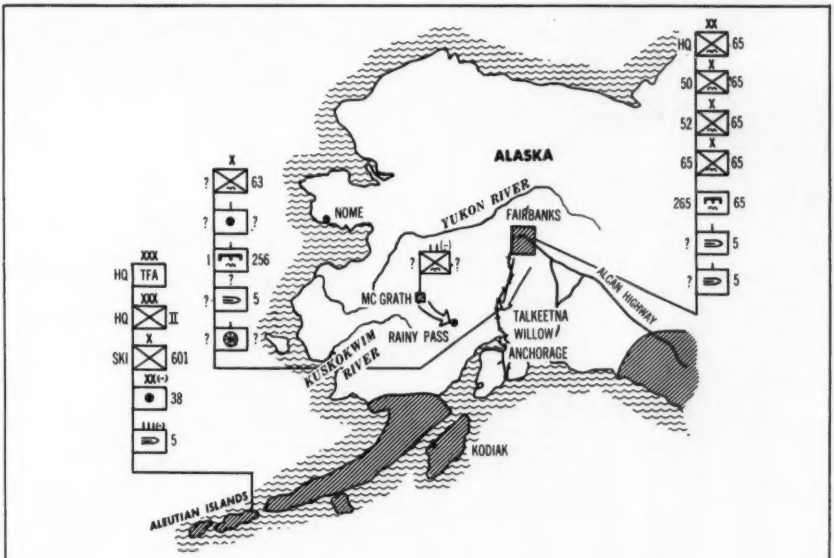
Aggressor (1st Battle Group, 23d Infantry, Reinforced) moved by rail (there is no road) to Talkeetna where Company A, 40th Armor, moving south by rail from Yukon Command, joined them.

The US Force moved by rail and highway to an assembly area near Willow, 70 miles northwest from Fort Richardson. Supply and maintenance areas were established for both forces and maneuver headquarters, housed in a railroad train, moved to Willow.

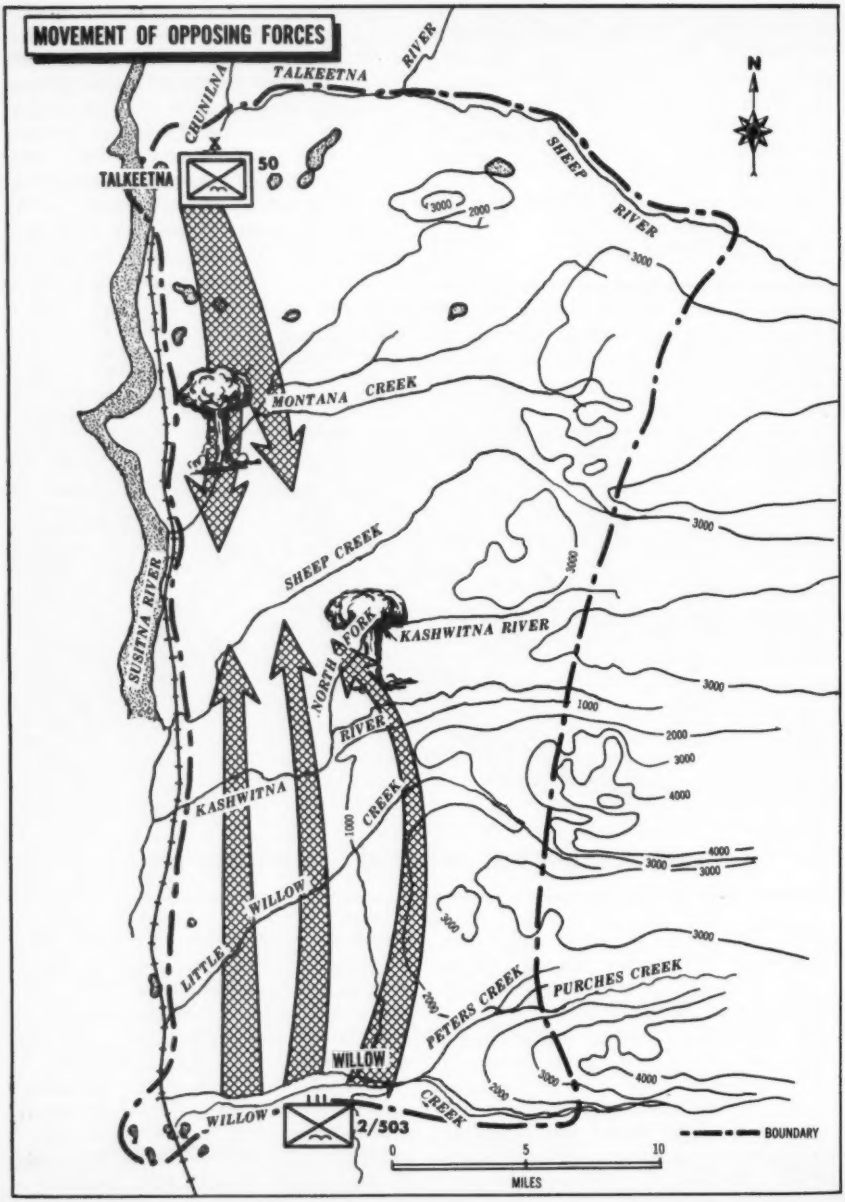
Missions

As maneuver preparations were completed, the two reinforced battle groups faced each other 45 miles apart in an area 16 to 20 miles wide. All-around security was a must, for there were no flank units. US Force had the mission of defending the Willow area. Aggressor was given the mission of seizing Willow and being prepared to continue the attack to the Anchorage area. Few controls, other than the initial mission type operation orders, were placed upon the battle group commanders. This was a free maneuver in an area that afforded infinite opportunity for either force to use imaginative tactics.

Both sides had a "nuclear capability" with the *Honest John*. US Force had an advantage here with their "Chopper-John," a helicopter-transportable SSM. Movement of Aggressor's *Honest John* required a



AGGRESSOR OCCUPIED AREAS AND SITUATION AS OF 9 FEBRUARY 1959


MOVEMENT OF OPPOSING FORCES
TALKEETNA RIVER
CHUNILNA
TALKEETNA
50
SHEEP RIVER
3000
2000
MONTANA CREEK
SHEEP CREEK
SUSITNA RIVER
KASHWITNA RIVER
NORTH FORK
RIVER
1000
KASHWITNA
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WILLOW
LITTLE WILLOW
PETERS CREEK
PURCHES CREEK
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CREEK
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road suitable for the heavy wheeled vehicle mount. The Aggressor commander chose to move south from Talkeetna toward Willow at the rate a road (suitable for movement of the huge truck-mounted *Honest John*) could be punched through the dense forest. He chose to conserve his strength until he could give an effective

companies pushed the road southward, laboring day and night.

Highlights

The US Force sent three columns north to the Kashwitna. Demonstrating superb physical conditioning, one company of men on skis moved north for 18 hours without

Major General Gilman C. Mudgett (left) explains features of the US Force "Chopper-John" to Mr. Hanson Baldwin, Military Editor, *New York Times*, and Mr. Adelbert Weinstein, Military Editor, Frankfurt (Germany) *Allegemeine*, who visited maneuver area

"knockout blow." Patrols operated ahead to locate the defending US Force and air observation posts were used extensively. Ground observation posts and listening posts, planted deep in the US area at night by helicopter, reported US Force movement by radio. Aggressor "battalions" leapfrogged forward, and remained dispersed to avoid presenting lucrative atomic targets. Engineer combat and construction

a rest and were ready to fight along the Kashwitna at the end of the first day. Log and ice bridges were built across creeks and rivers. Helicopters resupplied the dispersed US Force and moved the "Chopper-John" into position. An interesting use of helicopters was recorded here. Lacking ground control data for survey use, artillerymen sent a helicopter to hover above the few bench marks in the area

that could be located. Resection, using the hovering 'copter as the reference point, is unusual but proved to be accurate.

Much of the decisive action was the result of air activity. Air Force *C-123's* dropped US paratroopers deep in Aggressor territory. *RB-66* photoreconnaissance planes provided commanders with excellent photo coverage. Rapid delivery of photos allowed their use for nuclear target selection.

The most decisive nuclear "shot" was made by the US Force. Using aerial photos, and air observer and patrol reports, the US Force commander anticipated the development of a suitable target for his "Chopper-John" on D plus six. He moved the heavy missile launcher into position by Army helicopter. Aggressor struck, using SKYCAV tactics, but failed to destroy the SSM. The "Chopper-John" was fired and the US commander later learned that he had "destroyed" the headquarters "battalion," a rifle "company," and the commander and staff of the "brigade" except the S3 and executive officer who were away from the command post.

The majority of the fighting took place in the Sheep Creek area, and the maneuver ended on D plus eight.

Observations

Based upon Exercise *Caribou Creek* and other experience in Alaska there are a number of conclusions concerning our ability to operate in remote roadless areas that typify much of the northern latitudes.

Oddly enough, in the "wide open spaces" there seems to be trouble with dispersion. In a wooded trackless area covered with snow it is extremely difficult to know one's precise location unless it is checked by air. Constant attention is needed here by commanders to be certain that lucrative targets are not presented *unknowingly*. The tendency to "gang up" is pronounced in the remote areas.

Army aviation worked around the clock during the maneuver. *H-21's* (*Shawnees*) were in and out of all types of landing areas, night and day.

In spite of cold weather maintenance problems and heavy use, availability of all types of Army aircraft was *greater than 85 percent throughout the maneuver.* Aircraft used included the *H-21* (*Shawnee*), *H-13* (*Sioux*), *L-19* (*Bird Dog*), *L-20* (*Beaver*), and *L-23* (*Seminole*).

Each battle group force was supported by a combat engineer company and a construction company. This should be counted as minimum support in such a remote area. During the exercise approximately 60 miles of road suitable for wheeled traffic was constructed with five main stream crossings, numerous culverts, and corduroy sections.

Excellent communication to and from the maneuver area was the rule, but within the battle groups, dispersion of companies stretched radio and wire communications to the breaking point. Man-packed radios with a 25-mile range can be put to good use in this type operation.

For the troops from the other states, maneuvers such as Exercise *Caribou Creek* and next year's *Little Bear* come close to duplicating wartime situations. Continental United States organizations are required to move great distances to this area and adjust to new and more severe climatic conditions. Upon arrival in Alaska they "marry up" with stockpiled equipment and commence a short training period prior to the maneuver.

Conclusion

This type exercise provides excellent experience and training for participating units. Although small in size and in budget requirements, Alaskan maneuvers are significant to the Army.

The south central and interior sections of the 49th State are similar to a great part of the Eurasian land mass. Increased interest by military leaders in the northland is required. Here lies a critical strategic area of the future.

Above, 60th Field Hospital from Fort Lewis, Washington, provided medical support for both sides from the Willow area during Exercise *Caribou Creek*. Below left, aircraft mechanics worked out of doors in below zero temperatures to keep fixed- and rotary-wing aircraft operational. Below right, dozers from Aggressor 562d Engineer Company (C) push a road south through the stockade like forest near Talkeetna during maneuvers.

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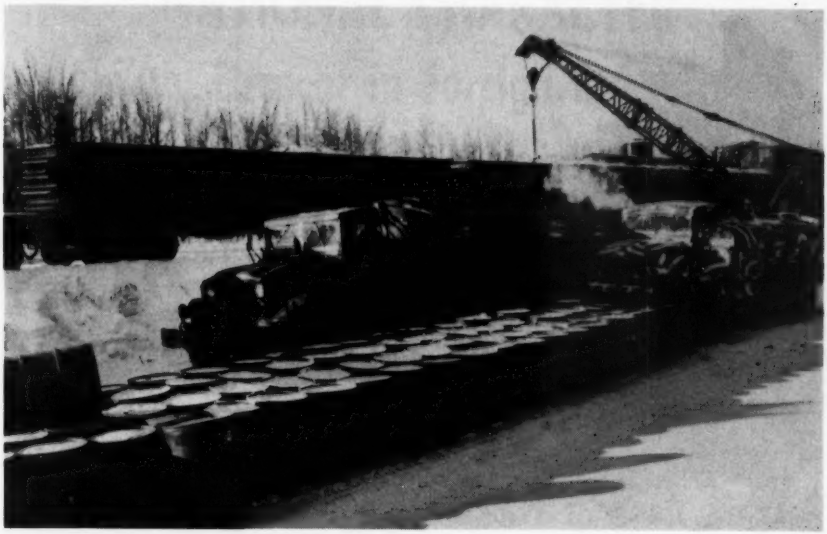
Above, US Force tankers and engineers reinforce the Kashwitna River ice with logs to provide a hasty bridge crossing. Below, *H-21 (Shawnee)* helicopters supporting both Aggressor and United States Forces worked day and night moving troops and supplies.



Above, during resupply operations petroleum, oil, and lubricants are unloaded from railroad cars at Willow, Alaska, during Exercise *Caribou Creek*. Below, *M59* armored personnel carriers with Aggressor Force head south through the forests near Talkeetna, Alaska.

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Above, a US Force tank overwatches construction of a log bridge across the Kashwitna River during Exercise *Caribou Creek*. Below left, a US Force *M41* tank eases across log reinforced ice bridge quickly constructed by tankers and engineers with 2d Airborne Battle Group, 503d Infantry. Below right, mortarmen set up their 81-mm mortars for "fire missions" in the deep snow near Question Creek. (All photos are US Army photos.)

NATIONAL CHARACTER

A Vital Element in Foreign Intelligence

Brigadier General Washington Platt, *United States Army Reserve, Retired*

IN THE production of strategic intelligence it is, of course, helpful to be as complete as possible in all factual components such as industry, population, and military strength. However, it is a grave mistake to overlook that great intangible summed up as national character and variously called national characteristics, national psychology, the national mind, or the spirit of the people.

A more complete title which avoids some possible misunderstandings is *National Characteristic Patterns of Behavior*. These titles, including their limitations, will be discussed later.

Such intangibles are less satisfying to study or to write about than the factual components first mentioned, because they cannot be quantified, and because statements made in this field are less definite than statistics of such items as industrial production or military equipment. Nevertheless, consideration of this great intangible, which will be called national character for convenience, is always important, and often will make clear matters of vital importance which *would not be evident from the study of any of the other components* of strategic intelligence.

National character is a term frequently used by historians; sometimes by social psychologists; and too rarely by those writing specifically about intelligence or national security.

Nations and Individuals

Character in a nation is closely analogous to character in a person. As a first approximation to a definition it may be said that national character manifests itself as *consistent patterns of national behavior* in various fields of activity, including fighting qualities, industry, progressive spirit, and will to win. It arises primarily out of the character of the people as affected by their national culture. In many cases the character of the *leadership* of the controlling groups is one of the most directly influential factors. Examples of such consistent patterns of behavior are: the *tenacity* of the British (in continuing to fight against heavy odds in World War II); the thoroughness of the Germans (in their scholarship and in their military preparations); and the optimistic, progressive spirit of the United States with a willingness to plunge in and try anything (as shown by their writing a Constitution, their settlement of the West, and their industrial progress).

Otto Klineberg's *Social Psychology* has an interesting and well-balanced summary of what has been done toward the development of scientific methods for the study of national character (or characteristics, or psychology as preferred). Although

The author wrote this article while holding a fellowship from the John Simon Guggenheim Memorial Foundation covering "studies of the basic principles of strategic intelligence in relation to national security."

Like individuals, nations have character. The study of the national character of a nation and its use for intelligence and international relations often will bring out factors not available from other sources

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much excellent work has been carried out, it is evident that only a small beginning has been made toward understanding principles and developing methods in this field. Little has been *proved*, according to the high standards properly set for proof in the natural or social sciences. From the present outlook it will take many years —say 25—before we can hope to be making statements regarding national character based on well-founded studies in psychology, anthropology, and political science.

Similarly, critical studies have shown that the pictures of national or group characteristics given by the prevailing national stereotypes are unsound and misleading.

Difficult Field

Should the strategic intelligence officer therefore say: "In this uncertain field, I could not be honest with myself or my readers if I pretended to give to the consideration of national character any weight whatever in estimating the capabilities or probable courses of action of a nation. I must wait about 25 years until the psychologist and the social scientists have made more progress with this problem?"

If this conscientious intelligence officer should make such a statement, he could be referred to the parallel question of personal character and personality. In this field the scientific situation is closely similar to that of national character. Many studies have been made. Experts disagree on important aspects of the problem. Much progress must be made in psychology and sociology before we can pretend to a scientific judgment of personal character.

Therefore, in his personal dealings, must a man who is honest with himself say: "Science has provided me with no reliable means for judging the character of the persons with whom I must deal. Consequently, I shall treat all men exactly alike in social and business dealings. Old friends and deadbeats will all be on the same basis. If I pretend to know the difference, I shall only be fooling myself?"

There is indeed no sure or easy road leading to an understanding of personal character. However, experience shows that the consideration of previous patterns of behavior—tempered with an understanding of the situation, and combined with some human judgment—seems to be successful in most cases of personal relations. A man would be foolish to believe that his judgment was infallible. He would be even more foolish if he refused to use the best knowledge and judgment already available in making decisions on the differences in personal character.

Study and Knowledge

It is the contention here that a closely similar line of reasoning should be used by the intelligence officer in his consideration of national character, except that in judging national character and its effect on the probable courses of action of a nation, much more study and knowledge and competence are necessary than in judging personal character.

It is believed that national character, properly defined, is a sound and useful concept. Limitations of space, however,

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Brigadier General Washington Platt, Retired, served as a Reserve officer for 33 years, retiring in 1951 at which time he commanded the 98th Infantry Division. He served overseas with troops in both World Wars and was Assistant Chief of Staff, G2, Headquarters Armored Command, and later for XIX Corps throughout the European operations in World War II. He was assigned as Chairman of the Department of Administrative Engineering at Syracuse University following the war. In recent years he has made a special study of principles and methods of intelligence production and is the author of "The Nine Principles of Intelligence" and "Forecasting in Strategic Intelligence" which appeared in the February and May 1957 issues of the MILITARY REVIEW *and which were based on his book,* Strategic Intelligence Production—Basic Principles.

prevent a detailed, critical study here. Rather, this discussion is centered on an analysis of the meaning of the term and some of the principal limitations. Assuming that the concept of national character is tentatively accepted by the reader (with or without certain reservations), the unique role of national character in strategic intelligence may be stated as follows:

A consideration of national character, as here defined, often will bring out important factors in a situation, and will supply guidance for estimates of the future which cannot be obtained in any other manner.

A man or government agency which fails to make full and enlightened use of national character in foreign intelligence and in international relations is *seriously handicapped*, and may even be completely blind to some areas of human conduct.

What is really meant by the phrase "national character"? In this explanation the analogy with personal character will be continued as long as it is of help, and it will be pointed out clearly where this analogy is no longer a safe guide.

Illustration

The following little drama will illustrate the capabilities and limitations of this concept. The *H*ero is Mr. *H*. The neighbors agree that Mr. *H* is courageous, industrious, generous, and trustworthy. The *V*illain is Mr. *V* who (we regret to report) is cowardly, lazy, stingy, and untrustworthy. What worthwhile meaning can be given to the above statement about the characters of *H* and *V* which sticks the closest to objective facts, and which rests as little as possible on shaky foundations?

As a first draft of what is meant, let us start with the statement: A man can be considered courageous, industrious, or generous if, as an observable pattern of behavior, it usually takes very little apparent inducement to cause him to act in a courageous, industrious, or generous manner. It has been observed over the years that *H* acts in these ways. No claim is made that *H* is *always* courageous. Extremely adverse external conditions may cause him to run away rather than to fight. Adverse inner conditions such as fatigue, discouragement, or illness may have the same effect. However, under most of the conditions pertinent to the characteristic in question, the chances are greatly in favor of *H* being courageous, industrious, and generous; and under these same conditions the chances are much against *V* showing any of these virtues.

It is admitted that every person contains within himself both courageous and cowardly impulses, generous and ungenerous impulses, but in *H* it takes little to bring out the former. In *V* it takes very little to bring out the latter. These results are evidenced by the actual *behavior* of each one.

Now assume that *H* and *V* have approximately the same income and the same financial commitments. However, it is known that *H* gives large amounts to charity, whereas *V* gives very little. So far the discussion is safe from the criticisms of the psychologist. It would certainly help in a very practical way in dealing with *H* to know *what motivated him* to give to charity. Perhaps he loved his fellow man; perhaps vanity led him to make a showing in his community; perhaps he feared hellfire. It would then be appropriate to know what element in his experience, his education, his culture caused him to love his fellow man, or to fear hellfire to the extent of a $1,000 gift to the local hospital. There is justification in trying to understand these two psychological questions and in coming to some tentative conclusions as to the answers since the conclusions may be applied in future dealings with *H* (or with *V*). If the conclusions are correct, they will help

to gain the desired point in personal relations with each of them.

It should be realized that the move from observed behavior to psychological motivation and cultural conditioning enters into a region of more uncertainties. However, doubts raised regarding psychological or cultural *explanations* for *H's* behavior cast no doubt whatever on the fact that in the past his actual *behavior* has been that of a large giver. This knowledge of motivation goes deeper than mere behavior. Such knowledge, if it can be gained, might be useful and even essential in estimations of a possible future change in the behavior of *H* or *V*. This understanding of motives, going deeper than mere observation of his past behavior, has great practical value if it can be achieved.

Applied to Nations

And so it is with nations. For the purposes of this discussion the national character may be called courageous or trustworthy if the pattern of behavior of a given nation indicates that it acts in this way over a wide range of circumstances. It may then be said with justification: "*H* nation has acted in a highly trustworthy manner in the pertinent past. It probably will continue to act in a trustworthy manner for the foreseeable future —unless we can find some reason to make us think otherwise." A study can then be made probing as deeply as possible into the underlying cultural, political, economic, psychological, and other factors which probably motivate *H* nation. An attempt is made to analyze its decision-making process, and to determine any radical change in conditions which would cause the nation to act differently in the future from its actions in the past. For such studies the concept of national character provides unity and guidance.

As a second aspect of the study of personal and national character, it is noted that some persons have a well-integrated, consistent character. Their action in any given circumstance can be predicted fairly well. Others on the surface seem to have a flighty, harum-scarum character, and seem to be quite unpredictable. This also is true of nations. Some, like Britain, the US, the USSR, Japan, and Germany, have characters which it is felt can be understood and can to some extent be predicted with confidence. Other nations, which superficially seem to be erratic, are shown to have important consistencies in national character when fundamentally considered. Such consistencies provide useful guides for intelligence estimates.

A third consideration arises from the fact that the characters of individuals change from youth to age. The wild youth becomes the cautious old man. This is not a serious difficulty in dealing with persons, because the character usually is sufficiently consistent over the period under negotiation. The same is true of nations. For intelligence estimating, the practical point here is that the actions a nation displayed long ago may have little bearing on its present national character. The British of the Tudors may give little help in understanding the British of today. However, national character usually does not greatly change within the period covered by an intelligence estimate. If it does change, indications of the change usually are available to those intelligence officers or diplomatic representatives who are really experts in their knowledge of that nation. So far, the parallelism with personal character is close and helpful and not misleading.

Important Differences

It has been said that in discussing any analogy it is more helpful to point out the discrepancies than the elements of similarity. Following are important differences between personal and national character.

1. The phrase "national character" may imply much more than is really meant

here. "Character" suggests a spiritual quality pertaining to something resembling an individual—perhaps like John Bull—with more unity than is possible in a nation. The term national characteristics as suggested by Klineberg, better fits our purposes, and the phrase *National Characteristic Patterns of Behavior* is the real meaning of our concept. However, the more familiar term "national character" is used here for convenience.

2. The psychological mechanism of an individual bearing on his character is tremendously complex. The psychological and other mechanisms of a nation bearing on character comprise a complexity of a higher order. One individual can often know another individual fairly well from personal observation; but no individual can know a nation in this way. Frequently, the nation has sufficient unity so that the national pattern of behavior is quite distinct. However, in some cases the groups within a nation are so diverse that the nation has no psychological unity and no real unified national character. In this instance, the interaction of the groups is considered and group character or characteristics, rather than national character, is the primary concern. Group character is nearer the truth, but more complicated to use for practical intelligence purpose.

3. Some social scientists logically divide the concept of national character into two parts—different but interrelated. These are:

a. The dominant traits of character possessed by the *individuals* within a nation.

b. The character of the nation when acting as a unit, that is, *as a nation.*

Thus "the German national character" may mean the predominant character of *Germans* (as individuals); or the character of *Germany* (acting as a nation). There is not space here to follow out this interesting line of thought. The intelligence officer must really consider both aspects.

Examples

The following examples illustrate that a consideration of national character often contributes new and vital factors in an international situation which cannot be obtained from any other source. In some cases these new factors are *in direct opposition* to evidence from other sources, so that the new factors necessitate a radical change in the over-all conclusions.

These examples are selected primarily because they throw light upon this peculiar quality of national character as an intelligence tool.

The Soviet Pact With Germany

In 1939 when Hitler's Germany was a growing threat to the nations of Europe and the shadow of a second World War was growing darker, the British sent a mission to Moscow to arrange for some measures of cooperation between Britain and the USSR. The British mission in Moscow apparently was making good progress when they were astounded to hear in August that the Soviets had just signed an agreement with Ribbentrop to cooperate with Germany instead of with Britain.

Later in the war—in August 1942—Churchill had the opportunity for an informal and rather intimate conversation with Stalin. This meeting is described by Arthur Bryant in *The Turn of the Tide,* and by Winston Churchill in his *Second World War, the Gathering Storm.* Churchill asked Stalin why the Russians had let the British down and sided with the Germans in 1939. Stalin replied in effect as follows:

We Russians knew in detail the military weakness of you British at that time. We knew the condition of the French Army and the degree of reliance that could be placed in it, and we thought you must

know it also. Under these circumstances, we Russians thought that the British and the French must be bluffing in their promise to support Poland. We could not imagine that you British would fulfill your agreements and would really declare war in the face of such well-known military weaknesses. So we Russians temporarily sided with the Germans.

Granted that this answer was lacking in candor, it is, nevertheless, highly probable that these considerations had a strong influence, as stated by Stalin, on the Soviet decision at that time.

This is a typical case of the necessity for considering national character as a vital component of strategic intelligence before drawing final conclusions as a basis for action. Note that all of the *hard facts* upon which Stalin relied for his decision were correct. His knowledge of the numbers of trained troops in the British Army, and numbers of planes in the British and French Armies was correct. If he had had twice as many intelligence officers, compiling twice as many facts *of this kind*, he would have been just as wrong. *Only by a consideration of British character* could he have foreseen that the British would declare war in order to make good their commitments, and to keep on fighting when they had so little with which to fight.

Emil Ludwig

Emil Ludwig was a distinguished German-born historian who left Germany in 1907 to become a citizen of Switzerland. When the clouds which foreshadowed World War II were gathering he wrote an article, "The German Mind," in the February 1938 issue of the *Atlantic Monthly*. The article illustrates his belief in the importance of national character as a vital factor in international relations. Brief extracts follow:

The man who regards raw materials as more important than a people's philosophy; or who believes that figures decide history and not feelings, is liable to be surprised by a sudden outburst of National Character. . . .

If before the [First World] War, the international secret services had busied themselves with other people's character instead of their guns, the Germans would have known what the Anglo-Saxon character means and would never have ventured on war. Today, if the Americans and the English would study German character, they might yet ward off the war which threatens. That is my reason for writing on this subject which I studied for 20 years.

The mystic bent in the German character is most dangerous in politics.

Ludwig, a distinguished scholar and lifelong student of European foreign relations, thus supports the contention that it is just as important for foreign intelligence services to busy themselves with other people's character as with their guns. One who neglects national character may be due for a rude surprise.

Projected Invasion of England

A vivid account of the projected German invasion of England in the critical months after Dunkerque is given in Peter Fleming's book, *Operation Sea Lion*. This book describes the situation both from the German and the British point of view. It describes the civilian and political as well as the military aspects of the threatened invasion of Britain.

Fleming has no ax to grind, nor any moral to draw. His sole purpose is to give a vivid, truthful, and well-balanced account of this dramatic episode in World War II. This he certainly does.

Even if Fleming teaches no lesson, he clearly has his own point of view and basic assumptions like all other historians. One of these—although it is not stated explicitly in so many words—is the necessity for understanding national character

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as a guide to foreign relations. Frequent references to this occur. He says for example: "the real, the ultimate reason why Hitler failed to invade England was because he failed to understand her." He says again: "he (Hitler) was not likely to be right about the (British) people, of whom he knew nothing at all."

It is Fleming's well-supported contention that it was Hitler's failure to understand the British character which led him to take exactly the wrong attitude toward the British on three or four critical occasions at this period. Again, Hitler's intelligence regarding British economics and military statistics, although not, of course, perfect, was reasonably adequate. His intelligence regarding the British national character was fatally deficient.

To show how fundamental and all-pervading this idea is, in Fleming's definitive description of this crucial episode in World War II, suppose Fleming's publisher had said to him: "In a military situation it is hard facts like guns and ships and supplies that count. National character is an exploded idea. Cut all reference to *understanding* the enemy people out of your book. Stick to hard facts." An examination of the text shows that the concept of understanding national character could not have been eliminated with a blue pencil by crossing out certain words, sentences, or even paragraphs. So basic is this concept to this book and by implication to the whole situation after Dunkerque, that much of the book would need to be rewritten in order to eliminate the national character concept. Furthermore, no other concept could replace it as an adequate substitute.

Conclusions

National character, considered as a well-founded and useful concept by many persons involved in foreign affairs, may be defined as a national characteristic pattern of behavior of a given nation under given circumstances.

Although national character, considered as a pattern of behavior, is a concept which is fairly definite, reliable, and usable in strategic intelligence, the elements of motivation behind the character can be known with less certainty.

Consideration of national character often will bring out important factors in a situation which cannot be obtained in any other manner and it should be explored as one important factor in intelligence estimates of the type previously described.

It is fitting to sum up with a phrase of Sir Winston Churchill, when speaking in December 1941, shortly after Pearl Harbor, to the Congress of the United States about the Nazis, he said: "What kind of a people do they think we are?" Not: "At what do they estimate our Gross National Product?"

We shall always seek to bring about a mutual understanding in the community of nations. We will make every effort to understand the desires and aspirations of our neighbors throughout the world, even though these aims may be in temporary conflict with our own. We will go the second mile with any nation which sincerely seeks the path to a just and honorable peace. However, we are determined to leave no doubt in the mind of any would-be aggressor as to what our actions will be in case of direct or indirect attack against Free World boundaries.

Secretary of the Army Wilber M. Brucker

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AIRBORNE ARMOR

Richard M. Ogorkiewicz

THE need of the Army to take to the air to acquire greater operational mobility involves two main problems. One is that of a sufficient quantity of suitable strategic and tactical transport aircraft; the other is that of air-transportable ground combat units.

Neither problem is new but they are becoming increasingly urgent. Growing recognition of the fact that massive nuclear retaliation does not provide the answer to many forms of aggression has reemphasized the importance of ground combat units. At the same time, the vast areas over which trouble may arise preclude, in many cases, the traditional methods of surface deployment of troops in adequate strength in the critical sectors, and increasingly turn attention to the alternative solution of rapid movement of ground combat units by air from strategically located bases.

To meet the requirement for combat units with aerial mobility considerable development already has taken place in air transport and airborne forces, and the latter have proved able to move swiftly, over considerable distances, in response to rapidly changing situations. However, examined impartially, the development has not been uniformly successful.

The main weakness of airborne forces has been their limited tactical mobility and weapon power. In fact, from the early airborne operations of World War II to the Anglo-French airborne landings at Port Said in 1956, airborne forces have consisted of little more than light infantry. As such, they proved invaluable on occasions, particularly in quick seizure of lightly defended objectives, but when faced with major hostile combat units their limitations became apparent.

The deficiencies which airborne forces have exhibited so far in tactical power and mobility might have been significantly reduced by the use of airborne tanks and other mechanized weapons. Unfortunately, only a limited amount of effort has been devoted to the development of air-transportable mechanized equipment, and armor has played a negligible part in the evolution of airborne warfare. Admittedly, so long as the basic equipment of armored units consists of 50-ton tanks and other heavy vehicles, the majority of armor must remain surfacebound. But there is no reason why armor should not contribute more to airborne operations than it has done in the past and why airborne forces should not exploit the potentialities of armored combat vehicles.

World War II

The limited progress with air-transportable armored vehicles is all the more unfortunate as they were shown to be a practical proposition more than 20 years ago. It was in the midthirties during maneuvers, in fact, that the Russians demonstrated with *T37* amphibious light tanks and their four-engined transport/bombers

Lightweight tanks and other battleworthy air-transportable mechanized equipment must be developed now in order to meet the growing requirement for effective combat units with aerial mobility and weapon power

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C-124

that armored vehicles could be delivered by air. However, the Soviet Army failed to make any use of air-transported tanks during World War II, as it failed to make effective use of its large airborne forces.

The Germans, who took the lead in airborne warfare at the beginning of World War II, also made no use of armored vehicles in their airborne operations. The successful German operations in Norway and in Holland in 1940 did, however, provide a powerful stimulus to the Anglo-American development of airborne forces which incorporated plans for airborne tanks almost from the start. In Britain it was decided early in 1941 to use the contemporary 40-mm gun *Tetrarch* light tank and to develop for it a special heavy glider —the *Hamilcar*. At about the same time, in February 1941, the United States began the development of the *T9* air-transportable 37-mm gun tank which evolved into the *M22*.

Unfortunately, the farsighted decision to develop a light air-transportable tank was not matched in time by the development of an aircraft capable of carrying the *M22*. In consequence, when the opportunity came for the use of airborne tanks in the large-scale three-division US-Brit-

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AMX13

C-130

ish landings on D-day in Normandy in June 1944, only the *Tetrarch* was used. And even then only seven actually were landed, by *Hamilcar* gliders, as part of the reconnaissance battalion of the British 6th Airborne Division. They proved useful but they were too few in number and too lightly armed to produce really significant results.

No airborne tanks were used in the next airborne operation at Arnhem, but United

M56

States-built *M22* tanks were used by the British 6th Airborne Division in the last major airborne operation of World War II—during the crossing of the Rhine in March 1945. Eight *M22's* actually were carried in *Hamilcars*, but only two survived the flak and the landing fit for action.

Thus the employment of airborne tanks during World War II was extremely limited. The principal reason was the shortage of suitable transport aircraft. Only 50 *Hamilcars* were available for the 1944 landings in Normandy and up to the end of the war there still were no other aircraft in service capable of delivering the *Tetrarch* or the *M22*.

In contrast, the major problem since World War II has been the lack of suitable tanks. The standard United States *C-82* tactical transport of the post-World War II period was quite capable of carrying the 15,600 pound *M22* but the latter, and the equally undergunned British *Tetrarch*, were already virtually obsolete when they were first used in airborne operations. The *M24* light tank was more powerful and at 38,750 pounds could be carried in the *C-124 Globemaster* strategic transport, but in the late forties its 75-mm gun armament no longer was adequate while its more powerfully armed successor, the *M41*, ruled itself out from the airborne field by weighing 50,000 pounds.

French Tank

Only the French Army had the foresight in 1946 to conceive a well-armed air-transportable tank—the *AMX13*. Although too heavy for such tactical transports as the *C-119* and *C-123*, and the French *Nord 2501 Noratlas*, the *AMX* has been carried successfully in the *Breguet 765 Sahara* and is within the carrying capacity of such more recent transports as the *C-130 Hercules* and the British *Beverley*. Thus by the midfifties the *AMX* acquired the distinction of being the only battleworthy air-transportable tank in service.

It was only after the prototypes of the *AMX* appeared that the somewhat similar *T92* air-transportable tank was designed in the United States. A little earlier came the 1949-specified *T101* airborne self-propelled gun, since standardized as the *M56*. At about the same time the Soviet Army also introduced into service an air-transportable 57-mm self-propelled antitank gun.

The adoption of the *M56* and its integration into the airborne divisions is a welcome step forward in the direction of air-transportable mechanized weapons. But for all its virtues, the *M56* barely touches upon the numerous possibilities in this field and its development was none too early.

The slow progress since World War II in the field of air-transportable mecha-

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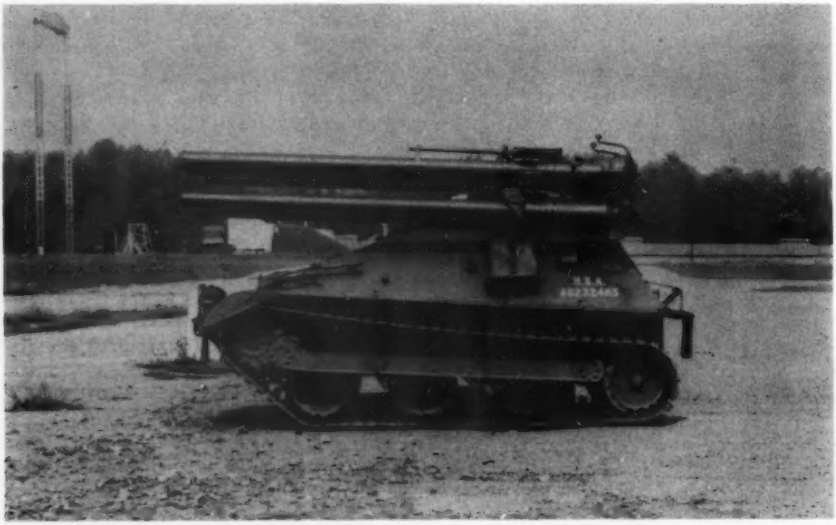
nized weapons has been due largely to an unwillingness to depart from the established trends toward "bigger and better" tanks and to reconsider the entire problem of armored vehicles in terms of the basic need of airborne forces for mobile weapon power. A few airborne enthusiasts advocated the development of lightweight air-transportable tanks, but in general little was done about bringing armored vehicles into airborne operations. It was converted to such farfetched schemes as the transport of 100,000-pound medium tanks of the *M46* class in experimental giants of the *C-99* type, instead of trying to develop lightweight vehicles within the 16,000-pound carrying capacity of the standard assault transports.

Current Trends

Admittedly, the problem of developing such lightweight air-transportable combat



Ontos

monly held that lightweight lightly armored combat vehicles would be at too much of a disadvantage in relation to the conventional types which could afford much thicker armor.

In consequence, the two organic tank battalions of the United States airborne divisions were equipped with relatively heavy standard-type tanks which made them surfacebound and perforce relegated them to the ground followup echelon. As a further consequence of this state of affairs, in the late forties attention was diverted to vehicles was not easy but the difficulties were not insurmountable. A solution to the problem of mounting sufficiently powerful conventional guns in light vehicles appeared as early as the closing stages of World War II in the shape of recoilless guns. Some of the potentialities of recoilless gun armed armored vehicles have been indicated since by the *Ontos* which has been adopted by the United States Marine Corps and which has been successfully parachuted from *C-130 Hercules*.

More recently, even greater opportuni-

ties for the development of powerfully armed lightweight vehicles have appeared with the introduction of short-range surface-to-surface guided missiles, such as the French *SS-10* and *SS-11*. With armament of this type capable of penetrating 16 to 19 inches of armor, light air-transportable vehicles are feasible which can destroy the most heavily armored hostile tanks and which thus can provide the answer to the most dangerous threat that airborne units have had to face so far. At the same time, the armor-piercing performance of the antitank guided missiles reemphasizes the futility of trying to develop heavily armored air-transportable tanks while the case for light armored vehicles is further reinforced by the needs of the missiles themselves. For optimum effect the short-range guided missiles need to be integrated into mobile weapon systems and this calls for highly mobile launching platforms such as suitably designed combat vehicles.

Lightly armored fully tracked vehicles could weigh as little as 4,000 pounds. Yet in spite of their lightweight, such vehicles could carry powerful armament. In consequence, there now is a definite possibility of providing battleworthy air-transportable combat vehicles and thus giving airborne forces the mobile weapon power which they have lacked so far.

In the meantime, even lightly armed air-transportable armored vehicles have shown their worth. For instance, when the first serious trouble occurred in the British Aden Protectorate in 1955, a troop of *Ferret* light armored cars rapidly delivered by air provided a valuable complement to air-transported rifle units.

Conclusion

There is no doubt that air-transportable armored vehicles would have been very useful in many operations. In the light of this and the technological possibilities there is every reason for greater effort in the development of lightweight tanks and other air-transportable mechanized equipment. Without it airborne troops will continue to be handicapped and unable to meet fully the growing requirement for effective air-transportable ground combat units.

We envision the time when the individual soldier will be equipped with almost unbelievable firepower. He will go into battle with weapons and equipment that just a few years ago were to be found only in science fiction, yet today are on the drawing boards or approaching the prototype stage. The future fighting man may have a two-way helmet radio, and perhaps television and infrared equipment; he may ride a flying platform or an aerial jeep; and he may carry in his individual shoulder weapon the thunderbolts of atomic firepower.

Lieutenant General Arthur G. Trudeau

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THE CORPS SUPPORT COMMAND

Lieutenant Colonel Jerry F. Dunn, *General Staff*
Office of the Deputy Chief of Staff for Logistics, Department of the Army

THE future organization of the administrative support structure of the Army in the field has been the subject of considerable discussion and conjecture. Proposals have been made which cover the entire spectrum of possibilities, to include functionalization, fractionalization, and technical service support structure.

All of the proponents agree on one point: The present organization for administrative support must change if requirements of the modern battlefield are to be satisfied.

Current Organization

Currently, the Army Troop Program contains hundreds of separate small technical service detachments, platoons, and companies from which the support structure for the Army in the field is provided. Except for a few engineer and signal battalions, controlling headquarters for these units are provided by separate battalion headquarters detachments. Under this arrangement, separate companies and platoons of a single technical service are combined under a technical service battalion and group headquarters according to the specific type of support performed. This so-called "tailored" concept of logistic organization prevents the maintenance of a balanced Army-wide logistic support structure which is in consonance with the combat forces to be supported. These independent logistic units train in isolation of troops they normally support and, when deployed, are joined with other logistic units with which they have never worked before. Subsequent redispositions during combat, each requiring a "retailoring" of the support organization, further complicate the problem of maintaining organizational integrity within our logistic units.

Organizationally, our tactical units are based on reasonably standard lines. The division is a fixed, standard organization. Nondivisional combat units are seldom smaller in size than organic battalions. From these basic combat unit structures, the standard or type corps organization is readily designed. The administrative support counterpart is not so easily determined. For each combat force structure the support organization must be determined as though it were a new and different requirement without precedent. Individually, the technical services have no standard organic support structure for backing up varied numbers of divisions. Each service has its own special way for organizing its units. Some services organize battalions and groups which are deployed vertically (front to rear) while other services performing like functions deploy their units laterally. Some services organizationally combine functions—others separate support functions into parallel organizations. The technical services system provides an organization made up of truly "mutually exclusive" supporting units.

Admittedly, it is impossible to design a support structure which will satisfy *all*

If modern battlefield requirements are to be satisfied, a more efficient support command structure must be established with elements for direct support of divisions as well as units to furnish general support to corps

requirements under *all* situations. However, it is possible, and certainly desirable, to provide a basic organizational structure which is designed to satisfy normal support requirements. The standard organizational elements of such a structure could then be augmented as required for any specific application. Such an organizational concept would eliminate from the Army Troop Program a great number of small separate technical service units in favor of standard balanced support organizations which can be activated together, train together, and enter combat together.

Guiding Considerations

Two requirements must be satisfied by whatever administrative support organization the Army may adopt:

First, the organizational structure must accommodate both nuclear and nonnuclear conditions, and both limited and general war situations. It is fundamental that the Army can never afford two or more sets of force structures each designed for a special battlefield environment.

Second, either the corps or field army echelon should be eliminated with the single remaining echelon normally consisting of four to six divisions and assuming both tactical and administrative responsibilities. On the dispersed battlefield the type field army will occupy an area many times larger than was envisaged when the field army structure was first adopted. Direction and control of administrative support operations by the field army staff under these circumstances will become extremely difficult if not impossible to maintain. (Hereafter the designation "corps" denotes whatever command echelon remains; either the field army or corps. In any case, the echelon directly above the division has both tactical and administrative responsibilities.)

Corps Support Command

The basic support requirements of the future battlefield have changed very little: we still need certain elements *directly* supporting and in close proximity to the divisions (classes I, III, and V supply points, field maintenance, evacuation hospital, transportation, bath and laundry), and we still need a deeper echelon for the *general support* of the combat zone to include supply reserves, maintenance backup, and hospitalization. Currently, these support functions are provided by separate technical service support structures each having mutually exclusive support responsibilities which are vertically controlled by the appropriate technical service staff officer at field army headquarters. Thus logistic support of the combat division is furnished through a sevenfold fragmentation of small technical service detachments, platoons, and companies which are located collectively in the same area in rear of the division but each remotely controlled through separate technical service channels. On the dispersed nuclear battlefield, direction and control through separate technical service vertical control channels will exceed span of control capabilities. The inevitable result in active combat operations will be an expedient assumption of local command of administrative support elements in a given area by someone possessing the leadership and knowledge, or perhaps, simply the loudest voice.

Furthermore, the vertical technical service support structure is unresponsive to tactical redispositions during combat without a retailoring of each technical service

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organization. The corps support command (Figure 1) to be responsive to tactical changes while maintaining organizational integrity of the support structure should consist of an appropriate number of balanced subordinate elements for direct support of the divisions, a number of balanced subordinate elements to furnish general support of the corps, and transportation units which are retained under centralized support command control.

The smallest fixed tactical element which contains combined arms and services is the division. The division is the basic denominator of the corps organization for combat. The division is the denominator for subsequent changes thereto. A redisposition of divisions during combat normally requires a corresponding change in the support structure. The proposed corps support command, in effect, packages into subordinate organizations the supporting elements which, due to their mission, normally operate in the same general area. These small support groups provide unity of effort under a single command authority which is directly responsive to the support requirements of a division or other specified element in the combat zone. There is retained a proper balance of supporting to supported without retailoring the support structure each time a redisposition of tactical forces occur.

The proposed corps support command is schematically deployed in Figure 2. An underlying feature of this organization concerns the control of support operations on the dispersed battlefield. Figure 3 portrays a corps in an extended front situation in the Washington-Baltimore area. The significant point is that a division in contact at Baltimore is supported by its direct support group located in the vicinity of the Pentagon and the supporting general support group located just north of Fredericksburg.

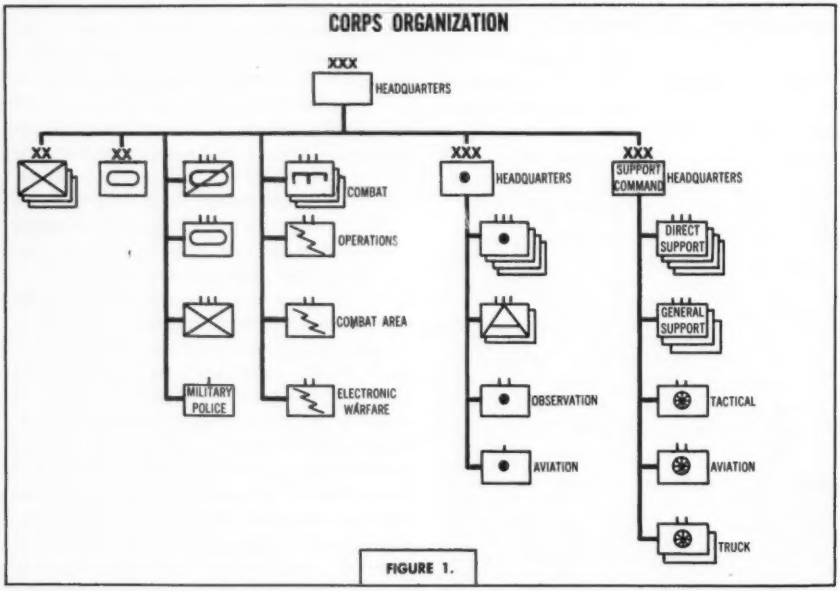

FIGURE 1.

Direct Support Group

Each direct support group is immediately responsive to the normal, daily, fast-moving support requirements of a division and the nondivisional troops operating in or immediately in rear of the division area for classes I, III, and V supplies (two to three days of supply), ordnance and quartermaster maintenance, and classes II and IV supply support, hospitalization and medical evacuation, military police, and postal service. The direct support group should be 100 percent mobile with organic transportation. The standard organization of the direct support group is indicated in Figure 4.

General Support Group

Each general support group provides general support for approximately one-third of the corps; reinforces designated direct support groups by stocking reserves of classes I, III, and V (five to seven days of supply); and furnishes maintenance and classes II and IV supply support of all technical services, hospitalization and medical evacuation, military police, individual and unit replacements, and personnel services; directly supports nondivisional troops in the area. The general support group should be 50 percent mobile in organic transportation. The standard organization of the general support group is indicated in Figure 5.

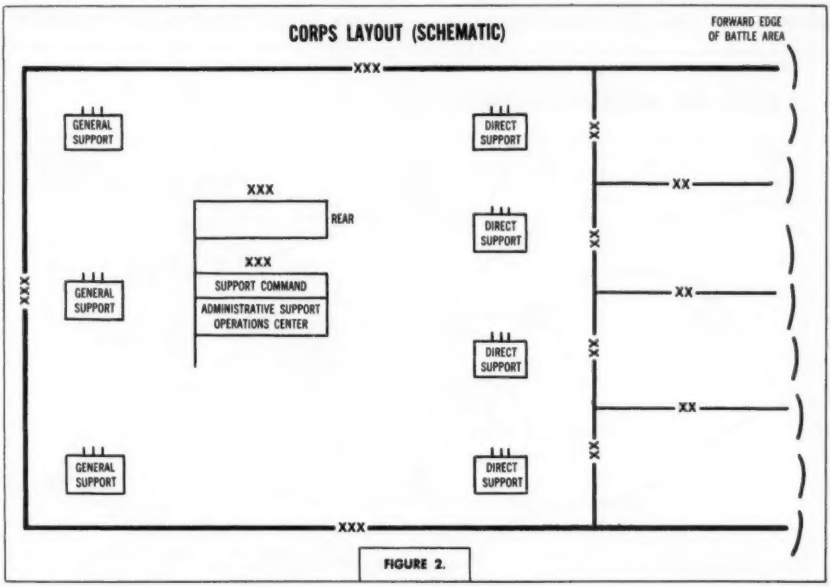

FIGURE 2.

Staff and Command

The *corps staff* includes *small* staff sections of the technical and administrative services who advise the commander and who:

1. Assist in the preparation of plans and policies.
2. Inspect current operations.
3. Settle differences between supported elements and the corps support command.
4. Plan and supervise the allocation of support for allied forces.

5. Recommend allocation of personnel and support within the corps.

The *corps support command* exercises full *command* authority over its subordinate elements and is responsible for receiving supplies and personnel replacements from the administrative zone and furnishing support to divisions and nondivisional troops in accordance with corps plans and policies. The *support command* includes staff sections of the technical and administrative services who advise the commander, and who supervise and direct current support operations. The corps administrative support operations center (ADSOC) is operated by the corps support command.

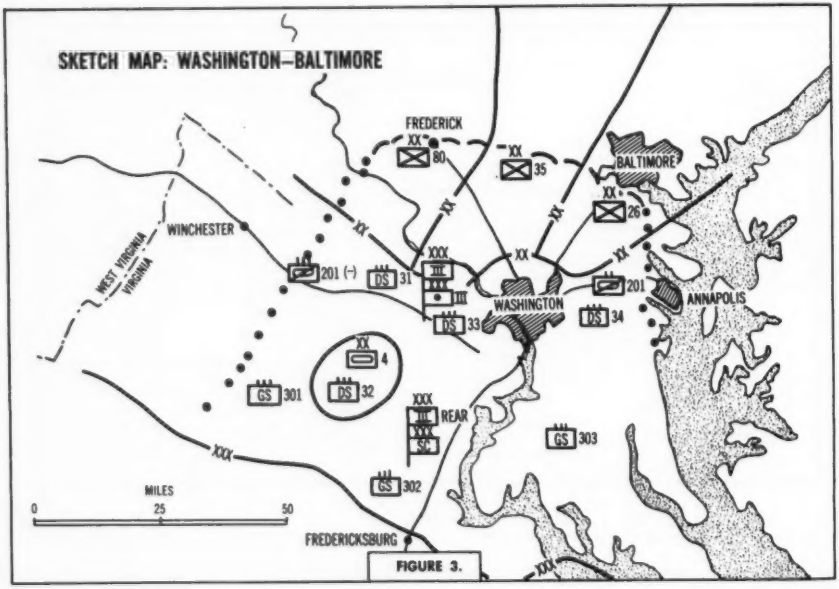

FIGURE 3.

Supply and Maintenance Operations

Tonnage supplies having a reasonably predictable consumption rate are distributed by intersectional transportation from base depots in the administrative zone directly to retail issue units or, where feasible, to supported units themselves (Figure 6). Supplies which are suitable for through-put movement are classes I, III, and V and a small amount of classes II and IV (mainly quartermaster clothing, preservatives and expendables, and some engineer construction materials and general supplies). Adjustments in the daily tonnage supply schedule is accomplished by a daily telegram which is originated by each direct support group based on information of future operations furnished by the supported division and is relayed by the corps ADSOC to the base logistical command. The advance logistical command monitors the daily telegram and is prepared to respond to unexpected demands which are not satisfied by the supply schedule. Further supply flexibility is provided by the five to seven days of reserve supplies stocked in the general support groups which are responsive to dis-

tribution instructions of the corps ADSOC.

The bulk of classes II and IV supplies (including organizational equipment, components, and repair parts) is distributed through technical service maintenance and supply units where technical skills and specialized tools can be centralized and organizationally integrated at each support echelon. This organization assures the close association and interrelationship of maintenance and supply. The decision to replace an unserviceable item of equipment by supply action, repair it on the spot, evacuate the item to a higher maintenance echelon, or cannibalize the item for parts should be vested in each supporting technical service maintenance and supply unit. Policy governing this "maintenance decision" is prescribed by the corps staff and is applicable to both the support command and the divisions. Ordnance and quartermaster maintenance and classes II and IV supply support is provided the division by the direct support group.

Maintenance and classes II and IV supply support of the other technical services is provided the division by the general support group which provides technical service maintenance contact repair teams according to the equipment population being supported. Direct exchange of items or subassemblies is made by on-site maintenance parties to the maximum extent. Supported divisions and nondivisional units request classes II and IV supply support (other than ordnance and quartermaster) directly on a specified general support group. Technical service staff officers exercise *technical supervision* over the maintenance and supply functions of their respective technical services.

Direct and general support groups are

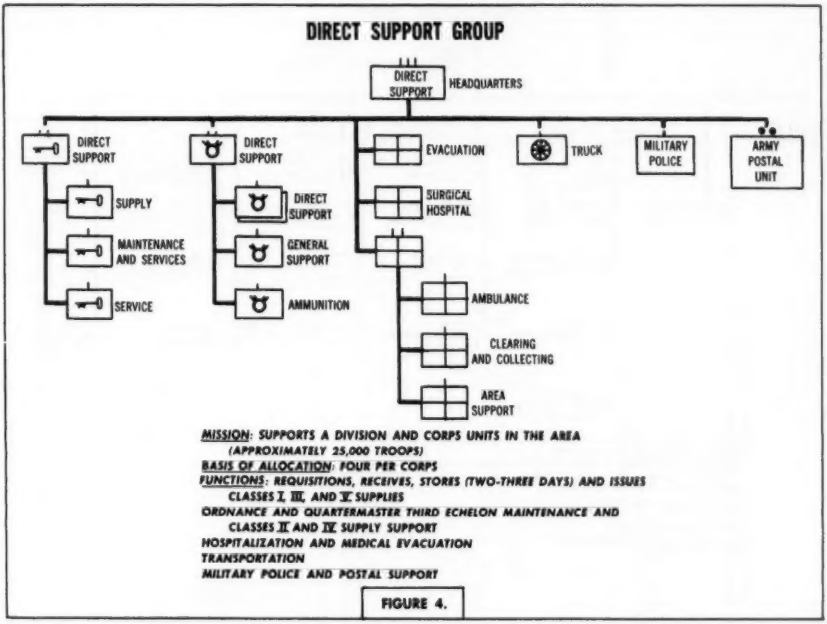

FIGURE 4.

provided organic transportation to satisfy their minimum requirements. Additional transportation is furnished by the corps support command under allocations made according to corps plans and policies.

Medical evacuation and hospitalization is provided by general support and direct support groups on an area basis. The corps support command surgeon exercises operational control over hospitals and medical evacuation units and coordinates medical evacuation with the principal staff surgeon in the administrative zone.

Policy and priorities for personnel and unit replacements are established by the corps staff with actual replacement operations controlled by the support command. The corps support command relays casualty loss reports, which are the basis of projecting replacement requirements, to the designated agency of the Theater Army Replacement Command supporting the corps. Replacement units and individuals are received, processed, and delivered to the supported unit by the general support group.

The personnel implications of the corps support command organization proposed herein are these:

First, the number of controlling headquarters (battalions and groups) is reduced from the number of technical service battalion and group headquarters employed under current doctrine.

Second, the direct and general support groups are, in fact, small logistical commands and as such are branch immaterial headquarters. The tables of organization

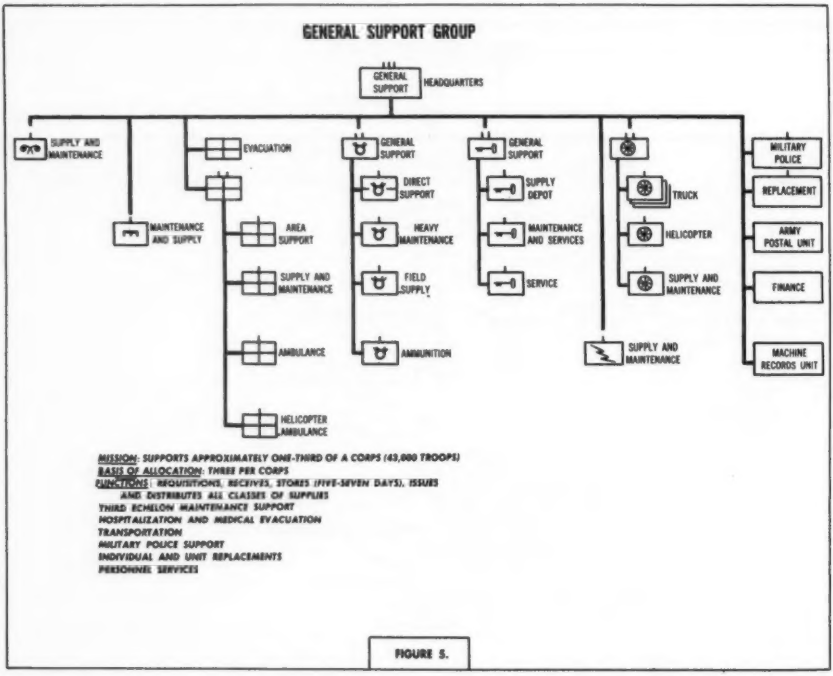

FIGURE 5.

NOTE: (1) DIVISIONS PLACE REQUIREMENTS ON DIRECT SUPPORT AND GENERAL SUPPORT GROUPS, RESPECTIVELY, FOR THE SUPPORT FUNCTIONS INDICATED

FIGURE 6.

and equipment of these organizations will provide for a number of branch material staff officers of the technical and administrative services and will also provide for a number of branch immaterial career logistics officers. The increased number of logisticians required under this concept will materially expand and strengthen the current Logistics Officers' Career Program.

Conclusion

The administrative support organization proposed herein promises to meet the challenge of the future battlefield. It provides unity of command, responsiveness to the supported element, and is economical of personnel. Admittedly, this organizational concept reduces the authority and prestige of the technical services within the combat zone. However, the concept does retain traditional technical service responsibilities for their respective commodity support. Adoption of this concept, or some variation, is long overdue. Full consideration is essential. Delay can only result in an adventure into revolutionary structures based on functional responsibilities of supply and maintenance which are far more radical than those proposed herein.

One of the major influences of atomic weapons on the battlefield will be to make rather extensive dispersion essential, in order to reduce the size of the targets we provide and thereby to minimize the effect of enemy strikes. Dispersion, however, will increase the feasibility of infiltration. With large-scale infiltration by both adversaries, it is very likely that the combat zone will become an area many miles in depth. . . .

* * * * * * *

Supply installations must be dispersed and duplicated, for the same reasons that dispersion is essential for tactical units. The increases in the ranges of modern weapons and the deepening of the combat zone may well require that the logistical installations be located considerably farther to the rear. Supply lines, while possibly being longer, will certainly have to be more numerous. Greater dispersion of the combat units being supported will complicate the logistics problem extensively.

General Lyman L. Lemnitzer

The Battle of Nicopolis

Robert Devereux

THOSE few persons who have heard of the Battle of Nicopolis, fought on 25 September 1396 (24 September according to some sources), very likely recall it only as one of the many victories won by the armies of the Ottoman Empire during its youthful days of vigor and military prowess. This obscurity is to be regretted, for the battle was, in certain respects, fully as significant as many others which are enshrined on the pages of history and which command the attention of the military student.

Historically, the battle had two important results whose significance generally has not been appreciated. Most historians have accepted the cliché that the Battle of Crecy (26 August 1346), in which an English army under Edward III annihilated a much larger French force, marked the end of the Age of Chivalry. It is submitted that this is an error. Crecy was not the end but only the beginning of the end. Chivalry indeed suffered a grievous blow at Crecy, but the death stroke fell almost exactly a half century later at Nicopolis.

Historians also are mistaken, it is believed, in asserting that the era of the Crusades ended in 1291. The Christian army that marched against the Ottomans in 1396 never reached or even neared the Holy Land; but it was a Crusader army nonetheless, motivated in large part by a Crusader spirit and assembled under papal sanction. Its failure to reach the Holy Land in no way altered its character, for, it might be noted, it was not the only Army of the Cross which never touched the shores of Palestine. Herbert Adams Gibbons, one of the few historians who have realized the significance of Nicopolis, phrased it well when he wrote that "the Crusade which ended at Nicopolis was the last great international enterprise of feudal chivalry."

Militarily, also, the battle warrants greater interest than has been given it. No new weapons were unveiled, no new battle tactics were employed, yet the student and instructor of military science will find a study of the battle not unrewarding. In all military history it would be difficult to discover a more perfect example of the disaster which must inevitably follow total disregard of even the most basic principles of sound military tactics; of the folly of lack of discipline and of experienced and unified command; of arrogant overconfidence and underestimation of the enemy; and of rushing into battle without adequate knowledge of the terrain or of the strength and dispositions of the opposing force.

Central Europe Menaced

In the closing years of the 14th century the shadow of the expanding Ottoman Empire lay dark and menacing over Central Europe. Christian Bulgaria had fallen to the Ottoman sword in 1389 and later that same year, on 27 August, the in-

The Battle of Nicopolis—the last Crusade and end of the Age of Chivalry—is a perfect example of the disaster which inevitably follows the total disregard of the most basic principles of sound military tactics

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dependence of Serbia came to an end on the bloody field of Kosovo. The victorious Ottoman leader, Murad I, fell to an assassin's dagger, but it brought little relief to Christendom since his son and successor, Bayezid I, proved equally capable and no less an implacable foe of Christianity.

Where and when the next blow would fall could only be conjectured, but King Sigismund of Hungary was convinced that his own realm would be the next to feel the might of the seemingly invincible Turkish hordes. Hoping to avoid disaster by striking first, Sigismund led his troops into Bulgaria in 1392, only to be driven back in utter rout after having gained a few initial victories.

The Ottomans, occupied with other matters, did not pursue the shattered Hungarian Army, but this respite brought little relief to Sigismund who was, if anything, more alarmed than ever. Having dared to challenge Bayezid on his own territory, he was certain that sooner or later the Ottoman leader would come to chastise him for his effrontery. He was equally certain that his own forces would be unable to halt the Ottoman advance when it came. In desperation Sigismund moved to obtain the help needed by presenting his plight to the other monarchs of Europe as a case of Christianity versus Islam.

His appeals to the religious sentiments and fanaticism then still so much a part of European life were not in vain. In 1394 Pope Boniface IX responded by proclaiming a Crusade against the Turks with full plenary indulgence to all Christians who should go to the rescue of Hungary. The rival Pope at Avignon also blessed the enterprise. But this papal support, as welcome to Sigismund as it was, did not suffice, for it did not in itself assure the feudal levies which were to hurl back the forces of Islam. Hence simultaneously he sent out envoys to the various courts of Europe.

France Pledges Support

Sigismund's special envoys to the French court, whose favor he especially desired, were well-received at Lyons in the spring of 1395 by the Dukes of Burgundy and Berry, uncles of the French King (Charles VI) and the real rulers of France. Sigismund's appeal came at an opportune moment. The cessation of hostilities between France and England not long before had left the martial youth of France and Burgundy idle and eager for new adventures. A politician and not a religious fanatic, Philip of Burgundy was unimpressed by the alleged danger to Christendom, but he wisely calculated that the absence from France of the restless and turbulent feudal chivalry would not only eliminate a probable troublesome element but also strengthen his own hold over the King and state. Moreover, assistance to Sigismund might well bring future political rewards inasmuch as his elder brother Wenceslaus was Holy Roman Emperor.

The decision of French participation having once been made, the organization of the Crusade which was to free Europe from the Ottoman threat began without delay. Philippe d'Artois, Comte d'Eu, a prince of the blood royal and Constable of France, departed for Hungary immediately with some nobles and 600 horsemen, while the Hungarian envoys hurriedly returned to Sigismund's court with Burgundy's written pledge of further substantial aid in knights and mercenaries.

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It was agreed that Burgundy's eldest son, Jean Valois, Comte de Nevers, 22 years old and only recently knighted, should command the French and other chivalry who were "to break the force of Bayezid in Hungary, and when this was done, were to advance to Constantinople, cross the Hellespont, enter Syria, gain the Holy Land, and deliver Jerusalem and the Holy Sepulchre from the hands of the infidel." The appointment to the nominal command of the young and inexperienced de Nevers solely on the basis of his royal blood was a mistake which was to have tragic consequences.

Knights, squires, men-at-arms, and mercenaries now began to assemble at Dijon, led by chevaliers bearing the proudest and most illustrious names in France: Henri and Philippe de Bar and Jacques Bourbon de Vienne, Admiral of France, all cousins of the French King; Sieur de Coucy; Boucicaut, Marshal of France; Comte de la Marche; Sir Guy de la Trémouille; Sir Reginald de Roye; the Lords of St. Pol, de Montmorel, and Sampi; three Flemish princes, brothers of de Nevers' mother; and many others, the very flower of French chivalry.

Others Join the Banner

The army marched from France in companies about the middle of March 1396. Sigismund's appeals for aid and the papal proclamation of a Crusade had not gone unheard elsewhere, and as the French traversed Germany and Bohemia they were joined by the chivalry of other countries who, spurred by piety or the lure of adventure or both, were drawn to the east. Sources differ greatly as to numbers, but probably 100,000 to 120,000 men were in the army which gathered at Buda in the summer of 1396, of which 10,000 to 12,000 were knights representing virtually every country of Europe. Count Frederick von Hohenzollern, Grand Prior of the Teutonic Order, commanded a group of Teutonic Knights, and from the island of Rhodes had come a contingent of Knights of St. John of Jerusalem under their Grand Master, Philibert de Naillac.

From Germany and Bavaria had come bands under the command of the Elector Palatine, of John, Burgrave of Nürnberg and ancestor of the House of Brandenburg, and of the Count of Munspelgarde. An Italian contingent was headed by the Bastard of Savoy, and one from Styria by Count Herman of Cilly. Others came from England, Scotland, Poland, Bohemia, Austria, Switzerland, Belgium, and Spain. In addition, Sigismund had collected the full strength of his own kingdom and of Transylvania and had prevailed on Mircea, Voivode of Wallachia, to break his treaty with the Ottomans and join the Christian coalition.

The Christian army marched south in two columns: the French-led smaller group through Transylvania and Wallachia, crossing the Carpathians through the pass between Brasov and Sinaia, the Hungarians along the Danube through Serbia. The Serbians had refused Sigismund's invitation to renounce their allegiance to Bayezid, so the Hungarians, despite the fact that the Serbians were fellow Christians and offered no resistance, pillaged and murdered as they went. In this they had ample precedents, for history records that Crusader armies generally brought more death and rapine to the Christian countries through which they passed than ever they visited upon the territories of Islam.

Early Successes

The war against Ottoman territory proper began auspiciously at Vidin which Sigismund took without a struggle. Orsova fell after five days' fighting. The Hungarians then passed on to Raco, which they took by assault, and then, again forgetting their holy character, put the garrison to the sword. In early September the two columns joined before the Danubian fortress of Nicopolis, which they closely in-

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vested by land, while a Venetian and Genoese fleet blockaded the city from the river. Despite his apparent hopeless position Doghan (or Yoghlan) Bey, the Turkish commander, prepared for an obstinate stand, judging correctly that Bayezid would not allow so important a fortress to fall without making every possible effort for its relief.

For 16 days Sigismund and his allies camped before Nicopolis without giving assault. The affair was treated more like a pleasure outing than a serious military operation, at least by the western knights. In arrogant confidence of their invincibility, they, and especially the French knights, gave themselves up to riotous carousal.

Even the most ordinary precautions to ascertain whether any enemy was approaching were neglected. In truth, the Crusaders saw no good reason for any such precautions. They were confident that Bayezid would not dare to cross the Bosporus, and in any case they believed he was too far away to constitute any immediate danger. Knowing little about the Ottomans and still less of geography, they believed that the Ottoman Sultan was in Egypt collecting a great army of all the world's Muslims. Had they been told that Egypt was not a part of the Ottoman domains they doubtlessly would have dismissed the fact as unimportant.

Even Sigismund who was better informed was infected by the supreme confidence of the knights and boasted that:

Let him come or not come, in the summer which will return, if it pleases God, we shall get through the Kingdom of Armenia and pass the Bras St. George and shall go into Syria and shall get from the Saracens the gates of Jaffa and Beirut and several other cities to go down into Syria, and we shall go to conquer the city of Jerusalem and all the Holy Land.

It was an ambitious dream which was soon to be dispelled.

Bayezid Moves His Forces

The Crusader delay before Nicopolis served Bayezid well, for it gave him time to concentrate and bring up his forces. Far from being in Egypt, he had been besieging Constantinople when news of the investment of Nicopolis reached him. Hastily abandoning the siege, he summoned an army of perhaps 60,000 to 110,000 men (the exact Ottoman strength is as uncertain as that of the Christians) to assemble at Adrianople. Marching north swiftly and silently through the Shipka Pass, he led his well-appointed and well-disciplined army into the valley of the Osam and, only two weeks after crossing the Bosporus, pitched his camp south of Nicopolis within six leagues of the Christian encampment.

De Nevers and his companions were at the table on 25 September when the surprising news arrived that marauders from the camp had come upon a great army of Turks near at hand. The fiery young paladins of Europe rose and ran to arms, excited by the prospect of the glory soon to be theirs and demanding that they be led forth instantly to battle against the infidel. Their eager anticipation was not shared by Sigismund. In spite of his previous brave words, he knew from experience the fighting qualities of the Turks as well as something of their normal tactics. Accordingly, he begged de Nevers and his companions to consult with him to formulate a plan of action.

Sigismund urged that some light troops be sent against the Turkish irregulars—Azabs and Akinjis—which could even then be seen hovering near, who also could make a reconnaissance to determine Bayezid's position and intentions. If it should appear that the Sultan was moving to attack, or on the point of moving, the foot soldiers from Hungary and Transylvania could sustain the initial attack, while the French and other cavalry, as the elite of the Christian army, would be held in reserve to meet

the subsequent advance of the Janizaries and Spahis, the best on the enemy side.

Advice Ignored

It was not destined to be a day for logic and commonsense. Sigismund's advice fell on unheeding ears, for of the knightly leaders only de Coucy, remembering perhaps Burgundy's charge to watch over his son, and Jacques Bourbon, Admiral of France, saw the wisdom of Sigismund's suggestions. The Constable (Comte d'Eu) and Marshal Boucicaut spoke for the overwhelming majority of the knights when they declared that the French would not suffer any Hungarians to precede them into battle. The knights, in fact, were as one in seeing in Sigismund's words only an unworthy attempt to deprive them of the honor and glory which was rightfully theirs and which they had come so far to find.

The impasse was broken and the fate of the Crusade sealed when d'Eu turned to the French standard bearer and cried, "Forward banner, in the name of God and St. George, for they will see me today a good chevalier." The action was contagious and irresistible, and soon perhaps 6,000 knights—French, English, German, Italian, and others—were galloping forward in what was to be the last charge of European chivalry against the armies of Islam. This mass charge of mounted knights in full panoply, their colorful banners flying, no doubt presented a scene which, captured on film in technicolor, Cinemascope, and stereophonic sound, would delight the heart of any Hollywood producer.

Militarily it could not have been more ill-advised. Not knowing exactly where the enemy was or what were his numbers, not thinking of where or how far they were going, without waiting to agree upon a concerted plan of action with the bulk of the army, the Christian cavalry sallied forth with only luck and Divine Providence to guide them. Both failed, and it can only be said that never was a military disaster more inevitable or more deserved.

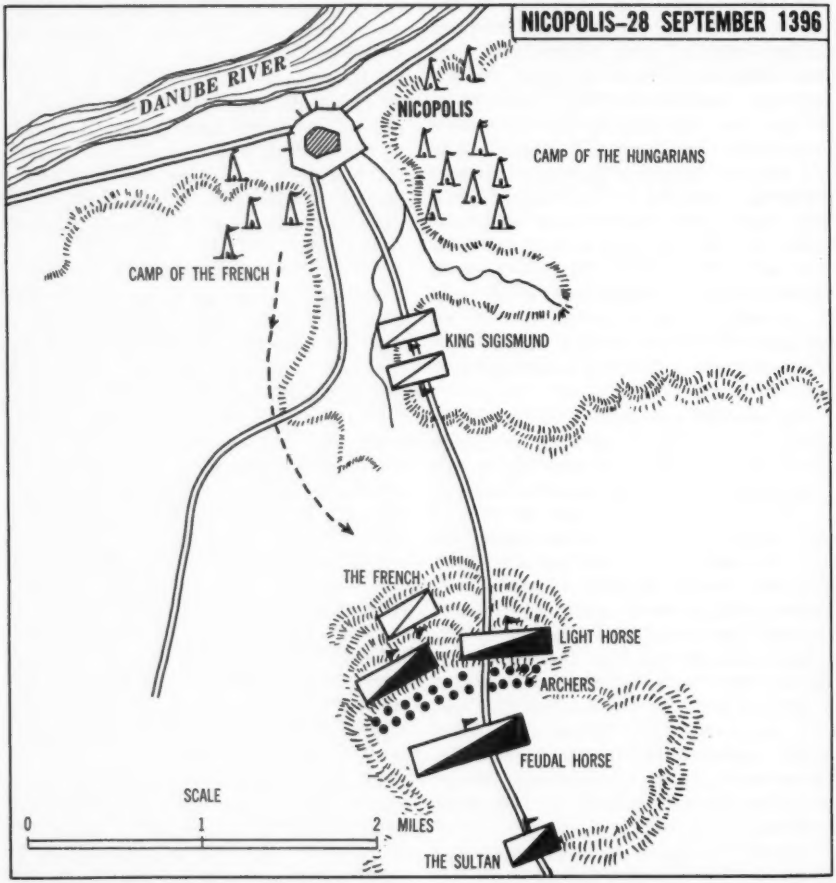
Bayezid had drawn up his main army in a plain not far from the Christian camp, hidden from Christian eyes by some intervening high ground. Dividing his forces into two sections, he sent forward his irregular troops, supported by a body of Janizaries and by a large division of cavalry, while his best troops, supported by his Serbian allies under their prince, Stephen Lazarovich, were deployed in perfect order beyond the skyline of the slope, effectively hidden from the unsuspecting enemy.

Battle Joined

The opening phases of the battle went well—perhaps too well—for the Crusaders. The onrushing knights quickly overran the Ottoman outposts, pausing only long enough to massacre the Muslims who had surrendered on promise of quarter. It was a senseless act of perfidy and cruelty which was soon to be regretted. Then continuing onward, disdaining to wait for the cooperation of the main Hungarian army which Sigismund had begun slowly to move forward, the knights rode down the Turkish irregulars like so many reeds and then charged the advanced division of Janizaries with leveled spears. This redoubtable infantry broke, and the knights next met with similar success the foremost squadrons of the Turkish regular cavalry, the Spahis, which were trying to cover the retreat of their comrades.

The day might still have ended in Christian victory had the elated knights at this point heeded the counsel of de Coucy and the admiral who implored de Nevers to order a halt and wait for the Hungarian army to come up or at least for long enough to rearrange the disordered ranks and for the horses to recover their wind. But again sanity was spurned in favor of unthinking action. Intoxicated by the heady wine of their easy triple victory, de

Nevers and his companions refused to abandon their chase of the fleeing Spahis. Suddenly, upon gaining the summit of the slope, the knights saw before them not the demoralized remnant of a defeated enemy they rode without, as far as history records, a second thought. The Turks, led by Bayezid himself, now began to extend and wheel their enclosing lines around the Christians, while the Turkish troops who



but a forest of Turkish spears in orderly battle array and in the advantageous positions which Bayezid had time to choose.

Whatever may be said of their military sense, the knights did not lack courage. Into certain defeat and probable death had been scattered in the initial advance now rallied and re-formed in the rear of the knights. Charged furiously from every quarter by superior numbers and fighting in confusion and disorder, with many of their horses killed by a cloud of Turkish

arrows, and with their own strength and that of their remaining mounts sapped by their previous exertions, the chivalry of Europe fought heroically as long as possible. But heroism alone was not sufficient; and barely three hours from the time they had so rashly rushed from their camp the best of that chivalry lay dead or were made prisoner.

Complete Defeat

A few of the knights succeeded in making their way back to the main army, carrying with them the disheartening tidings of defeat. Meanwhile, Bayezid restored the regular formation of his troops and advanced to engage the main Christian army. Cowardice and treachery now sealed the disaster brought on by rashness. Mircea of Wallachia and Laczkovich of Transylvania, commanding respectively the left and right wings of the Christian army, together with their forces, fled from the field in panic to seek safety on the northern bank of the Danube.

The central division of Hungarians, commanded by Sigismund, and the Bavarian and Styrian contingents, which also were posted in the center, remained alone to face the advancing Muslim host. Standing firm and undaunted, they not only repulsed the Turkish charge but advanced in turn against the Janizaries and Spahis, forcing those chosen troops to retreat. At that moment Bayezid committed his Serbian contingents which proved decisive. In a short time the rout of the Christians was complete and the Crusader army had ceased to exist.

Sigismund's Hungarian division was almost annihilated, and all the Bavarian and most of the Styrian knights died around their standards. Sigismund, accompanied by the Grand Master of Rhodes and a few other leaders, fled ignonimously and managed with difficulty to get away in a small boat and aboard a Venetian galley. What still remained of the army, leaderless and panic-stricken, was either killed or drowned in the Danube; only a few survivors managed to cross the river and retreat through Wallachia.

Reprisal

After the conflict Bayezid rode over the field of battle, his rage mounting as he saw how heavy his own losses had been. And when he learned of the massacre of Turkish prisoners by the knights after they had ridden through the Ottoman outposts, his fury became uncontrollable and he ordered a general massacre of Christian prisoners as an act of vengeance. The next morning the entire Turkish army was drawn up before the city, and the prisoners, hands bound behind them and with halters round their necks, were brought out.

In anticipation of a heavy ransom Bayezid spared de Nevers, who was able to persuade the Sultan to spare 24 others (d'Eu, de Coucy, Henri de Bar, Comte de la Marche, Boucicaut, to name a few) for the same reason. The Sultan then gave the signal for the grisly slaughter to commence. In detachments the prisoners were led before the royal tent in front of which Bayezid stood with de Nevers and his spared companions who were forced to witness the fate of their comrades—a fate for which they themselves, save de Coucy, were largely responsible.

The killing continued from morning until late afternoon when Bayezid's own counselors, acting more out of avarice than compassion, persuaded him to enslave rather than kill the prisoners who still remained alive. Bayezid's order saved an uncounted number of lives but it came too late for an estimated 10,000 whose blood had already stained the Bulgarian soil that day.

So ended the last Crusade, and so ended also the Age of Chivalry.

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"WHY NOT DIVARMOR?"

Lieutenant Colonel Francis J. Kelly, *Armor*
Faculty, U. S. Army Command and General Staff College

ON 28 January 1959 changes in the organization of the infantry division were ordered by the Department of the Army and United States Continental Army Command. Without going into a detailed investigation of the specific changes, it is readily apparent that the revisions were in keeping with the axiom that "we progress or regress—who stands still, stagnates."

Obviously, the basis for these amendments was the desire to improve the personnel-firepower ratio, with the objective of achieving more effective destruction without additional personnel commitments. The changes, resulting in the concentration of additional firepower, did increase the kill ratio.

There is an additional area, however, which has not been thoroughly investigated and that is the massing of tank fires currently available within the infantry division.

Opinions vary as to the efficacy of the tank in the fire role it should play in combat operations. Some hold that the tank is primarily and singularly a direct-fire weapon. Other factions would play up its indirect fire capability as the primary role. What is often overlooked is the simple fact that the tank has both capabilities and can combine fire *and* maneuver.

Mobile, combined-arms warfare techniques will be the common denominator on future battlefields, nuclear or nonnuclear. It is not sufficient to install reactionary changes in either force structure or statistical evaluation. (Reactionary is intended in its generic sense—changes resulting from conditions that present a problem and a solution is reached as a result of the posing of the problem.) Changes in nomenclature or even in force structure are not sufficient, if such changes merely revise old terminology or regroup existent ideas. How much difference in employment really exists between two (regiments) up and one in reserve, or three (battle groups) up and two in reserve? New concepts are needed, or surely the old ones will not survive a radically different environment of war.

Use All the Firepower

The firepower of the infantry division tanks is not being wasted, nor should such inference be drawn. Yet it is questionable if total capability is being used to its maximum. For example, the following tank and antitank fires are organic to the infantry division.

Tank, 90-mm gun	92
Tank, 76-mm gun	33
Gun, 90-mm, self-propelled, *M56*	20
	145

This sum of weapons is more than twice the number of artillery howitzers

A more effective use of tank and antitank fires available within the infantry division can be achieved if an organization (DIVARMOR) which is analogous to that of the division artillery (DIVARTY) is established

and launchers currently available within the infantry division as indicated in the table below.

What method can be employed to take maximum advantage of the tank and antitank capabilities of the division? A proposed solution is to establish within the division an organization analogous to that of division artillery.

3 battle group support battalions, towed	
105-mm howitzer, towed (each battalion–6)	18
155-mm howitzer, towed (each battalion–6)	18
2 battle group support battalions, self-propelled	
105-mm howitzer, self-propelled (each battalion–6)	12
155-mm howitzer, self-propelled (each battalion–6)	12
1 division support battalion	
8-inch howitzer, towed	4
Honest John, self-propelled	2
Total	66

The major subordinate elements of the infantry division as currently constituted are indicated in Figure 1.

It is proposed to adjust this organization by establishing an armor organization as shown in Figure 2.

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Lest it be assumed that this is a nomenclature reform along the lines previously discussed, examine the DIVARMOR organization, as shown in Figure 3, (Division Organization), and Figure 4, Headquarters and Headquarters Troop, DIVARMOR.

The headquarters and headquarters troop depicted in Figure 4 is essentially the same control organization as found in the combat command of the armored division.

Specific Proposals

The specific recommendations proposed here are as follows:

1. Install the DIVARMOR organization as indicated.
2. Eliminate the position of assistant division commander.
3. Transfer the present duties and responsibilities of the assistant division commander to DIVARMOR.
4. Eliminate the brigade concept and personnel requirement.
5. Expand the division tactical operations center by inclusion of an armor fire coordination section (AFCS).

One of the primary considerations in nuclear warfare is the provision for an alternate command post (CP). It is presumed that this requirement, along with that of a readily available headquarters for special task forces, prompted the establishment of the "brigade headquarters." If an alternate CP requirement ever

CURRENT COMBAT UNITS, INFANTRY DIVISION

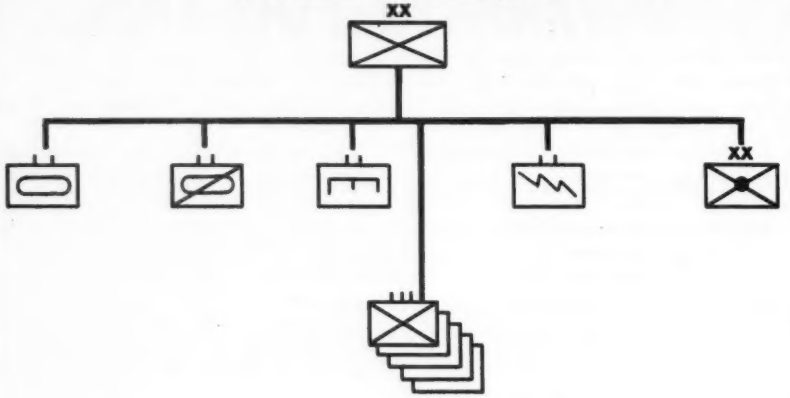

FIGURE 1.

SUGGESTED REVISION IN COMBAT ORGANIZATION

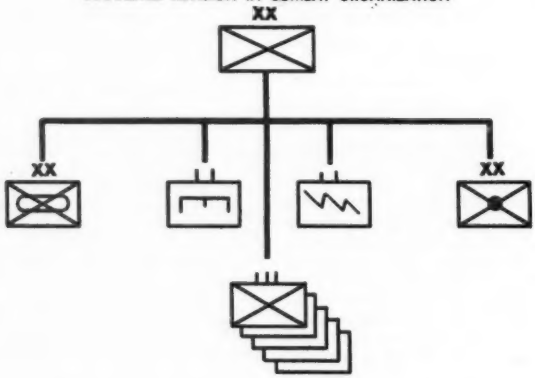

FIGURE 2.

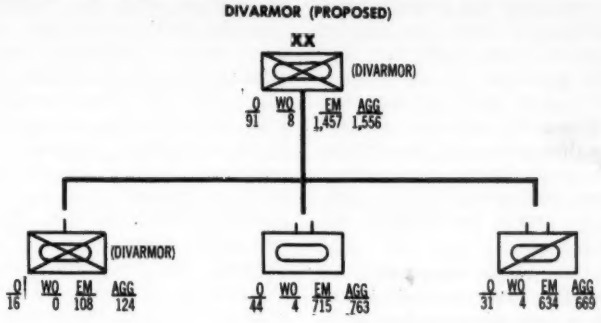
DIVARMOR (PROPOSED)
XX
(DIVARMOR)
O 91 WO 8 EM 1,457 AGG 1,556
(DIVARMOR)
O 16 WO 0 EM 108 AGG 124
O 44 WO 4 EM 715 AGG 763
O 31 WO 4 EM 634 AGG 669

FIGURE 3.

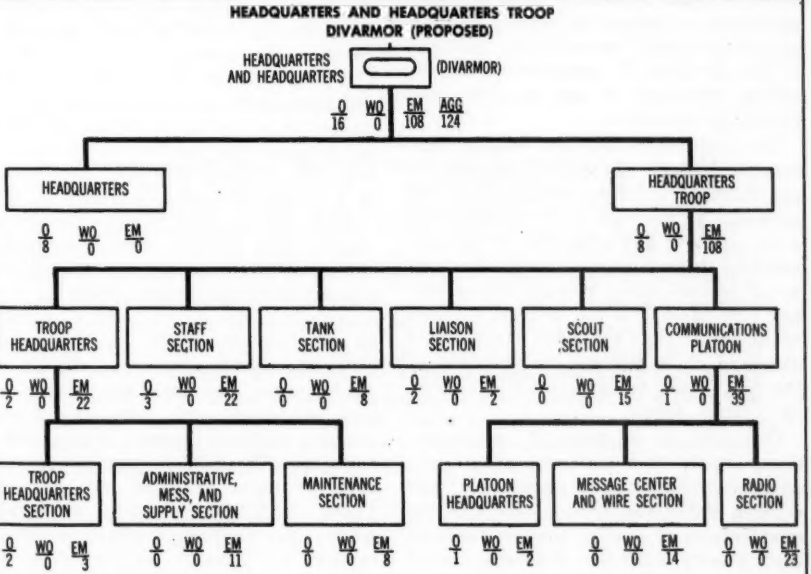

FIGURE 4.

materializes, obviously the brigade headquarters, withdrawn from the division staff, is likely to prove ineffective. The positions and personnel of the brigade staff are provided by tables of organization and equipment, but are mingled within the staff sections of the division headquarters. If the division headquarters were rendered ineffective, it is a little shortsighted to expect the brigade designees to be spared.

Nonetheless, the major requirement for a readily available headquarters for special missions or task forces as needed is still present. The establishment of DIVARMOR more than adequately meets the needs of both an alternate CP, capable of immediate operation, as well as an effective, trained nucleus for the conduct of mobile combat operations of a combined nature on a nuclear battlefield. This arrangement would increase the flexibility of the alternate CP assignments, thereby adding insurance to any plan for continuity of command.

The position of assistant division commander (ADC) currently fluctuates in responsibility in direct proportion to the personalities involved. It is somewhat of a misnomer in any event, for if the commanding general is not present, the next senior general officer becomes commander, and very often it is the division artillery officer rather than the ADC who assumes command. It is believed the functions of the ADC could be carried out effectively by division armor.

Certainly, in the fields of communications, supply, and maintenance—as well as the coordination of support for all track vehicles within the division—the multiple combinations of applied support facilities over greatly extended distances cannot be overlooked. Yet such communications and logistic procedures do not just happen, they must be carefully planned and controlled or support will be lacking.

DIVARMOR as conceived here could be charged with the responsibility for planning and discharging counterattack plans, division antitank planning, technical advice on, or operational responsibility for, rear area security and rear area damage control, as well as the supervision of division training in noncombat conditions. Much as the division artillery officer is charged with marshaling comparatively static artillery fire, the division armor officer could just as easily be charged with marshaling the division's maneuvering firepower. This would, of course, demand great coordination of fire support within the division area.

Fire Support Centers

In fire support coordination centers (FSCC) the techniques now in use are fairly stylized and have been refined over the years, rather than revolutionized. Thus it is a point of conjecture as to whether the current technique of an FSCC is suitable for nuclear warfare. Certainly, it is reasonable to examine its modernity in view of the tactics which will be required for nuclear existence. The need for cohesive planning, particularly in a nuclear situation, is overly obvious.

With this in mind it appears that the concept of a division tactical operations center (DTOC) is a more satisfactory solution to the complicated interplay of all manner and means of tactical support. In this concept, DTOC would function under the staff supervision of the G3 and would control and integrate current tactical operations with organic and nonorganic tactical support, among other functions. The TOC is organized on the basis of eight principal duty sections. These are: G2-G3 operations; air defense section; fire support coordination section; tactical air support section; electronic warfare section; chemical, biological, and radiological section; engineer section; and Army aviation section.

Note that the extensive armor firepower is not included or considered. It is

proposed that an additional principal duty section, the armor fire control section (AFCS), be added.

The armor fire control section (AFCS) would be that portion of the armor staff which operates in the TOC and which coordinates and integrates armor support with current tactical operations. This section would provide centralized review of armor requirements, support, capabilities, and limitations. Within this section, advice on the employment of armor could be obtained and the judicious use of armor communications and support facilities could be integrated into current tactical operations for the most efficient and economical use of all armor or armor type vehicles within the division, exclusive of artillery and engineer carriages or prime movers.

Adoption of the DIVARMOR organization would result in a minimal increase in personnel. The proposed organization (Figure 4) shows 16 officers and 108 enlisted men as the complement of headquarters and headquarters troop, DIVARMOR. A reduction by at least a factor of 0.4 is considered quite practical, since the functions of supply, maintenance, and other forms of administrative support can be satellited upon existing divisional units. The main point is that with a very minor increase in personnel, the resultant improvement in delivered firepower is a highly profitable arrangement.

Clearly, we need every weapon firing at maximum effectiveness, if any imbalance in strength of forces is to be overcome. Some solution to intensifying the kill capabilities of the infantry division weapons must be found. Why not DIVARMOR?

In touching upon the roles of the Army and the functions of the Infantry, I have not meant to depreciate in any degree the valuable and indispensable support of the other combat arms and the technical and administrative services in performing the many duties which devolve upon the Army. Rather it would seem to me that, while I have stressed the importance of the Infantry's role . . . we may see in the future an even closer amalgamation of the arms and services than ever before. We should properly maintain a competitive spirit within the elements of the Army in order to stimulate progress through new ideas and concepts. These latter must then be objectively evaluated in the cold light of their military worth and battle effectiveness, irrespective of branch partisanship or tradition. Whatever changes they may suggest, it is clear that our Army in any future type of war will derive its versatility and staying power from the Infantry, its shock action and protected tactical mobility from Armor, and its supporting heavy firepower from the Artillery.

General Maxwell D. Taylor, Retired

INVERTED PYRAMID

Colonel Robert C. Ingalls, *Artillery*
Faculty, U. S. Army Command and General Staff College

TRAINING is the lifeblood of the Army; training in peace, in situations short of conflict, and training in combat. Although training generally is conceived and implemented on a broad base, there is necessity for training a "hard core." Without specifically defining the term "hard core," suffice to say that it implies a degree of skill and of permanency and continuity of effort among a relatively small group.

During this early period of rapidly developing nuclear and other modern weapons concepts, the "hard core" has been represented by "specialists," or technicians. History, both industrial and military, has shown that the specialist's skills ultimately will be learned by many and will become normal utility. It is primarily a question of time.

In the field of nuclear weapons employment it is a temporary truism that the only "specialist" or fully qualified weapons employment advisor available to the tactical commander for today's battlefield is the nuclear weapons employment officer (NWEO). He is the *officer* who has successfully completed a special, condensed course of study and been awarded a prefix digit 5 to his military occupational specialty. Currently, these qualification courses are being conducted at the United States Army Command and General Staff College, Sandia Base, and in six branch service schools as directed by the United States Continental Army Command. What was once accepted as an exclusive, somewhat scientific function now is rightfully tabbed as a normal training necessity for officers. The small "hard core" of officer specialists now is to expand to thousands in number.

This has been brought about through the efforts of many agencies in developing concepts, doctrine, and simplified tools for the employment of advanced weaponry.

These concepts, doctrine, and tools which provide the basis of training for the NWEO can be attributed in great part to the Nuclear Weapons Employment Course of instruction which has been conducted at the USA CGSC since 1952. As a model or prototype course it is providing a means to develop and maintain the broad base of training as directed by USCONARC.

Expand "Hard Core"

The question has arisen in the minds of many, "Why not expand the 'hard core' of qualified nuclear weapons employment personnel to include noncommissioned officers and enlisted personnel?" The answer is that such action is inevitable. There is precedent to support this assumption. For a number of years artillery fire support operations were surrounded by an "aurora borealis" mysticism. Fire direction operations and conduct of fire functions were carried out by a relatively small "hard core." World War II and combat in Korea

To place the working knowledge of our powerful weapons on a broad base, the "hard core" of qualified nuclear weapons employment personnel must be expanded to include noncommissioned officers and enlisted personnel

found enlisted personnel performing many of those activities which at one time were carried out primarily by officers.

This expansion of the "hard core" was born of necessity and realistic appraisal of human capabilities, available manpower, and of the requirements of combat. Means were developed to adapt the skills of the "specialist" to the common user. The same evolution has occurred in other functional areas such as survey, meteorology, and navigation.

In each instance marked advantages have accrued from training noncommissioned officers and enlisted personnel to take over appropriate functions. It has provided that degree of permanency and continuity required. Officer personnel, whose responsibilities broadened and heightened with length of service, were released to exercise their command and supervision responsibilities. Noncommissioned officers were given responsibilities commensurate with grade and qualifications.

Functions to Be Performed

This proposal, or answer to the question "why not," does not envision placing the total responsibility of the NWEO on the noncommissioned officer and enlisted specialist. Stated in a positive manner, those functions which are highly repetitive, mechanical in nature, time consuming, readily learned, and hold a similarity to functions and responsibilities already performed by trained noncommissioned officers and enlisted personnel are the ones to be incorporated in formal schooling and unit training. For example, plotting fallout predictions is akin to survey plotting. Other functions to be considered include maintenance of records and files concerning availability, allocations, expenditures of weapons; the mechanical processes in the development of fire plans; template construction; and certain calculations used in the detailed numerical system of target analysis.

There have been isolated cases in which noncommissioned officers have been employed to learn certain aspects of the nuclear weapons employment functions. A more formal and thorough integrated approach is required to develop the necessary teams for the various echelon operations centers. The first consideration to accomplish this training is appropriate for the branch service schools having already established enlisted courses and the "know-how" for teaching nuclear weapons employment techniques and procedures.

In this connection, official action has recently been taken to establish Enlisted Specialist Target Analyst positions in both staff and units possessing nuclear weapons employment officers.

The presentation of this type instruction might well be a controlled test or an experiment initially and accomplished within resources currently available within branch service schools. A few selected noncommissioned officers and enlisted personnel who have a formal education equivalent to or higher than that required by most states in their public school systems would be a suitable source of personnel to participate in this training. Experience in tactical operations centers, particularly

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fire support type and related operations, would provide appropriate background.

Personnel who participate in this training will discover an interesting challenge, one which will produce great satisfaction. But more important, they will be making an immeasurable forward stride in the development of the Army's capability; its quality manpower. An experiment of this type would assist in determining those functions of nuclear weapons employment which are most adaptable to ready learning and application. In addition, it should provide indications of necessary individual prerequisites for selection of noncommissioned and enlisted personnel to receive this type training. Once criteria are established, selection can be by design rather than happenstance.

USAR Program

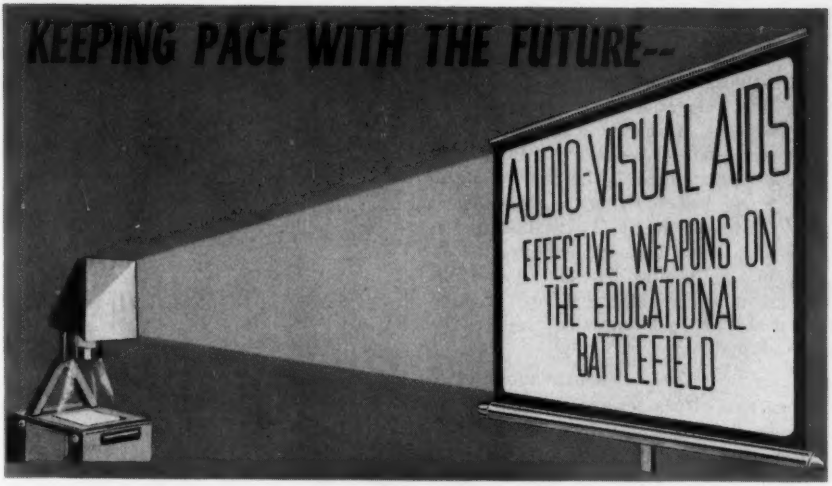
The total Army or "one Army" objective also leads to consideration of introducing this type formal instruction in the United States Army Reserve school program. An exploratory consideration of purpose and scope for such courses will determine the facility and effectiveness with which they can be instituted. An immediate problem will arise on the question of security and classification. This must not be a deterrent. Great strides have been made in the reduction of the amount of classified materials in the nuclear weapons employment field. A considerable portion of the Basic Nuclear Weapons Course of Study presented in career courses by the USA CGSC is unclassified and is extended to representatives of our allied countries. A second problem will be the requirement for qualified instructors. An increasing number of officers of the Reserve components are taking the nuclear weapons employment training in each course conducted by the USA CGSC. These personnel are a source of competent instructors.

Conclusion

In brief, recognition has been given by the Army to progress which has been made and which must continue to be made. It accepts the fact that working knowledge of normal, albeit powerful, weapons and "hardware" must obtain on a broad base. Symbolically, success on the battlefield cannot be permitted to sit on an inverted pyramid.

The fact that military techniques have become vastly more complex, especially since the end of World War II, is so well-understood that it needs no special emphasis. By present standards, much of the equipment of even 1945 vintage appears relatively rudimentary today. We are concerned now with some of the most advanced aspects of the physical sciences—from the standpoint both of their application for military purposes and of discovering advances which will permit additional or more effective application.

General Lyman L. Lemnitzer



Major W. C. Washcoe, *Signal Corps*
Faculty, U. S. Army Command and General Staff College

Sounds which address the ear are lost and die in one short hour; but that which strikes the eye lives long upon the mind; the faithful sight engraves the knowledge with a beam of light.

—Bulletin of the Pantographic Academy, 1852

This is the sixteenth in a series of articles expanding various aspects of "USA Command and General Staff College Keeps Pace With the Future," written by Major General Lionel C. McGarr, USA, *Commandant of the College, and published in the April 1957 issue of the* MILITARY REVIEW. *—Editor.*

NEVER before in history have events moved with the speed of today. Even cursory notice of the daily advance of human knowledge indicates the need to depart from the habits and methods of yesterday. A sense of urgency is apparent wherever thinking people gather, and nowhere is this sense of urgency more deeply felt than in the field of military education.

Realizing that knowledge is power and that time is fleeting, the U. S. Army Command and General Staff College is vitally concerned with its responsibility to educate selected graduates of the branch schools to the desired degree of higher level professional competence. This military education cannot afford a leisurely

The instructional aids program of the USA CGSC—keeping pace with the forward-looking educational philosophy of the College—provides the latest and most modern facilities to support instruction which is oriented on problem solving, reasoning ability, and decision making

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pace; consequently, Fort Leavenworth must achieve the ultimate in rapid, effective, and meaningful instruction. The tempo is one of wartime, and the battlefield, where a decisive struggle for knowledge is being waged, is the field of education. Never has there been a more urgent need for more effective instruction in less time. The all-out instructional effort necessary to achieve the desired goals at the College is being reinforced by the judicious use of such valuable weapons as audio-visual aids.

Early in 1957 the Commandant directed a concerted attack toward the goal of improvement of teaching methods, simplification of the preparation and reproduction of instructional materials, and improvement of training aids. Recognizing that audio-visual techniques are symbolic of what is new and forward-looking in educational programs, his 1957-58 curriculum guidance covered improvement of the audio-visual program in support of methods of instruction which were to be oriented on military *problem solving, reasoning ability, decision making,* and *communication.*

This guidance led to a staff and faculty briefing in two parts: new ideas for training aids, and simplification of prep-

Major W. C. Washcoe was graduated from Pennsylvania State College in 1938 where he received a B. S. degree in electrical engineering. He was employed for four years in New York's professional theater in stage lighting, stage management, and design before entering the Army Signal Corps in 1942. He served throughout World War II with the Army Security Agency. He was Chief, Army Security Agency, Hawaii, from 1947 to 1950, and upon graduation from the Signal Officer Advanced Course in 1950, was assigned to the Office of the Chief, Army Field Forces Board 1, Fort Bragg, North Carolina. Upon completion of the Regular Course of the USA CGSC in 1955, he became Chief of Editing and Publishing Services of the College. Major Washcoe is now on orders to Korea.

aration and reproduction of instructional materials for the 100 percent curriculum rewrite directed for the 1957-58 academic year. In this latter regard the task of rallying the force to an all-out effort to publish a 100 percent rewrite was a sizable one. Development of a system of priorities, together with "forced phasing" of manuscript submissions, constant counseling of authors for improved quality in

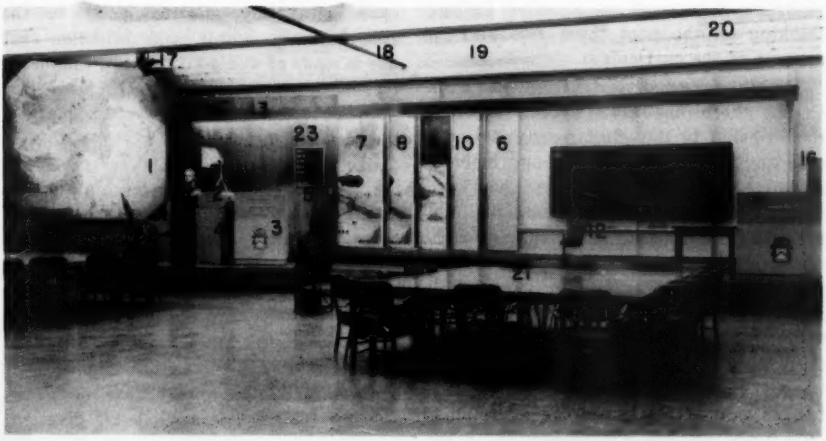

Figure 1. A typical USA CGSC classroom

Overhead transparency rear screen projection (1) operated by the instructor at the projector (2) or lectern (3) and matching level projector stand (4). Selectively switched ceiling lights, projectors, etc., can be controlled from the lectern or face of panel hideaway (5). A projection-white steel chalkboard (6) is centered on the front wall. Four large chart panels are provided, two (7) and (8) with iron screen over tackboard to permit use of magnetic aids over tacked-up charts, one (9) with inset piece of green chalkboard, and one (10) with a second projection white chalkboard. Panels slide to expose any two at a time. A standard overhead (11) and wide angle projectors (12) can be used on surfaces which accommodate chalk, charcoal, magnetic aids, and "blacklite" materials. "Blacklite" source is behind panel light cove (13). A large green chalkboard (14) four portable multipurpose and two double-sided swinging chalkboards (not shown) are provided. A movable lectern (15) and instructor's lockable bookcase (16) are at right. Dimmable spotlight (17) is provided in some cases. The room, equipped for 50 to 55 students, can be divided by curtains on tracks (18) to provide four work group areas. Lights are baffled (19) against glare and some baffles (20) are also acoustical. Light sturdy groupable tables (21) are used in various arrangements. Instructors' tables (22) are provided as is an assignment board (23). Wall colors are light-yellow green, front and right; gray with gray audio-visual blinds left, and warm beige (peach) at the rear. Floor is low reflectance bisque colored asphalt tile, ceiling white, beams and columns gray. Other features not shown are instructor-controlled 16-mm motion picture and slide projectors, opaque projector, issue boxes, two walls of installed cork tackboard capped with sliding hooks for hanging 4 by 8 foot display panels, four double-sided swinging 4 by 4 foot tackboards, tape recorder, security lockers, and intercom system that can be used for routine and emergency calls, as well as to introduce AM-FM radio, recorded or taped material into selected classrooms.

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copy preparation, and planning to minimize slippage in the program, accomplished this unprecedented task.

Philosophy on Use of Aids

Before looking at the new approaches to audio-visual aids under the 1957-58 guidance, it is well to consider College thinking on the part these aids play in support of the curriculum.

Among seasoned instructors at USA CGSC, there has always been a deep-rooted belief in the effectiveness of visual aids and their use has been aggressively supported. However, there had not been as much aggressiveness in production, development of visual standards, and equipment improvement. There was room for increasing effectiveness—for new ideas and new long-term economies. This will always be so! The audio-visual field, more than most, is responsive to imagination, ingenuity, and constructive effort pointed toward improvement. However, one must objectively determine what will and what will not effectively support the instructional methodologies throughout the curriculum. Concentration on one type aid and denial of others which can be useful is shortsighted. It is recognized, however, that the approach to this complex problem must be on a case-by-case basis, as solutions to audio-visual problems at one installation are not necessarily suitable for use at others.

No single aid can substitute for a variety of media, each of which can make its own unique contribution to specific learning situations when used by a skillful instructor. Aids used in combination can complement and reinforce each other. Maximum benefit results from a cross-media approach especially in the development of concepts and in problem solving. Variety and change in pace in audio-visual support to instruction keep student minds active and alert. Any audio-visual aid used exclusively will cause student interest to wane.

The instructor at the U. S. Army Command and General Staff College has a threefold instructional task: researching his material, preparing Subjects, and communicating essential learning experiences effectively and efficiently to the student. It is in this communication that use is made of audio-visual aids, commonly termed "instructional aids." Instructors appreciate the capability of the poet's pen, the artist's brush, and various technological facilities such as recording and photography to assist in stimulating student interest and understanding and so they use a wide variety of informative instructional aids.

The inherent nature of audio-visual materials, namely their concreteness, makes it imperative that they be of high quality, authentic, and accurate. In addition to their informative nature, use of audio-visual aids is encouraged to give the learner a basis for thinking and understanding, to create and influence attitudes, to overcome the limitations of time and space, to show processes which cannot otherwise be seen, and to compel attention. Aids are chosen to do a specific job at a specific time—and are conceived as supplements, rather than as self-contained teaching devices.

The Instructor Training Course and Instructor Workshop emphasize ingenuity, imagination, and economy in lesson preparation and presentation. Time is devoted to acquainting student-instructors with basic audio-visual materials and media, and with forthcoming new equipment and materials to permit early orientation toward effective audio-visual usage.

Many persons contribute to the evolution of an effective aid. First, the analytical mind of the author of a Subject conceives the need for an aid, considers the point to be made, and determines how

it can be introduced and the extent to which it will contribute to the instruction. Then the imaginative mind of the author or the instructor visualizes the aid—one that will give a true picture of the idea to be presented—determines a meaningful approach, and relates the aid to the experience and interest of the student. Next, creative minds develop the detail of the aid. These generally include the Instructional Aids Consultant and the artist-illustrators who, using College standards [1] and guidelines, create an aid that is properly designed, utilizes color, mass, and balance effectively, and will be legible to all students in the classroom. Finally, the instructor combines the merits of the aid with his own enthusiasm for his Subject to emphasize an instructional point. Quality rather than quantity of aids is the policy, and imagination plus originality are encouraged in their development.

Before a new audio-visual item or technique is introduced, it is studied by the Chief, Editing and Publishing Services, the Educational Advisor, and the Chief of Resident Instruction to determine the function it can play in teaching and learning. Only after careful weighing of *advantages offered against costs involved* is new audio-visual material introduced.

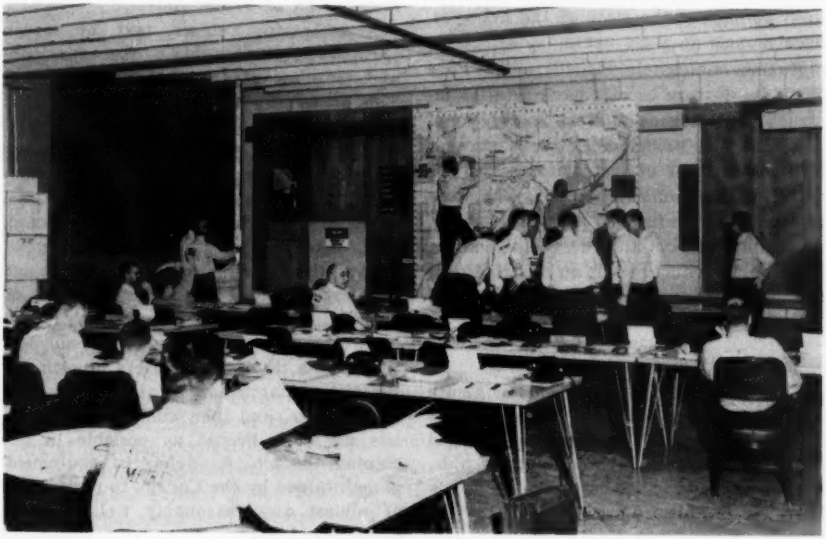

Figure 2. A typical classroom in use by umpires for a two-sided map maneuver

Because of the limited amount of money available for the over-all operation of the military school system, sound management procedures demand that in every expenditure the *long-term economy* be considered. In the classrooms at the USA CGSC, instructor-operated facilities are used; assistant instructors, even projectionists, are not authorized except in mass communication facilities such as the auditorium and briefing room, and for occasional special classes. However, educa-

[1] *Contained in Instruction Circular 3.* Style Manual and Editing and Publishing Services, *prepared annually by the Chief, Editing and Publishing Services, and published in advance of preparation of each new curriculum.*

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tion which cultivates the highest creative reasoning and problem-solving potentials of individual officers must be ensured of adequate budget support consistent with sound over-all fiscal policy. The educational objective is creativity, not conformity, and it cannot be achieved solely by standardized procedures that can be programed years in advance; on the contrary, the system must be sufficiently flexible to keep abreast of the state of the art—yes, even pioneer in some areas.

Earlier articles in the "Keeping Pace With the Future" series have detailed instructional methods and the instructional program. The principal characteristics of the new methods of instruction which reoriented the audio-visual program were the new emphasis on problem solving, reasoning ability and decision making, and the introduction of an instructional method newly emphasized at the College —Small Group Activity.

Production of Aids

The most useful ideas for aids originate with the author-instructor team. While "standardized aids" are not used, rigid standards are used in production of aids, in their use, and in the design of the rooms in which the aids are used.

Audio-visual Center

Instructional aids functions at the College have become increasingly centralized in an Audio-visual Center, Instructional Aids Branch. The over-all program has been directed toward improvement of instruction by an integrated production organization maintained to support classroom instruction. It is organized on a functional basis, with various sections devoted to separate phases of production. As a corollary support, an efficient distribution system is maintained. This places aids either in the hands of the instructor or in the classrooms, ready for use, on a timely basis.

Within the office of the Chief, Editing and Publishing Services, is an Instructional Aids Consultant officer whose principal duty is to provide audio-visual information, and a consultation service to the instructor. He suggests creative ideas for visual aids and advises on criteria and guidelines required to maintain College standards.

Preparation of Visual Aids

A successful Subject, text, or speech normally is attributable to the experience and training of the writer or speaker. This is equally true of the visuals used by the instructor, writer, or speaker. Dictating hard and fast rules for the exact *composition* of a good visual is impossible. A visual aid is a form of art, the formation of which requires experience, skill, ingenuity, and imagination beyond that of the ordinary artist or draftsman; its creation should be the responsibility of visual aids specialists. The wise instructor gives the visual aids specialist all pertinent data, thoroughly briefs him on the subject or particular point the visual is to illustrate, and then allows the specialists as much license as possible in designing the aid. A variety of equipment is maintained by the College to permit use of almost any reasonably well-prepared audio-visual aid.

The overhead projection transparency has become the mainstay of USA CGSC projection type aids. The simplicity of the production processes, the chance for variety in technique of presentation, and the efficient instructor-operated projection equipment available have led to its widespread use. This has greatly reduced the use of the more expensive large graphic panel charts and the use of color film transparencies as well. Approximately 100,000 transparencies a year averaging two and one-half colors are made this way, including many for the nonresident program. United States Army Reserve (USAR) schools have to depend almost

entirely on the overhead projector; they do not have the varied facilities which are available to resident instruction. Many panel and easel charts, "magic wall" presentations, slides, displays, and even exhibits, used in resident instruction, are converted to overhead transparencies for nonresident use. Experience has shown this move to transparencies to be a major step forward in instruction conducted at USAR schools.

In production, mechanical devices are used wherever possible to save more expensive human skills. Free-hand lettering is becoming a lost art in America. Lettering devices, image enlarging devices, and pasteup pressure sensitive materials are among the items which have been useful in overcoming this shortage.

The combination of instructional aids facility and an Army Field Printing Plant in the same building, both under Editing and Publishing Services control as to scheduling and workload, is a fortuitous one. Many of the graphic processes of the two are interchangeable and one can help the other through the crises of production that are inevitable under the present-day era of dynamic change. Equally important is the College operation, integral to the Audio-visual Center, of the Fort Leavenworth Photographic Laboratory and the Film and Equipment Exchange—94 percent of whose effort is in direct support of the College.

New Approaches

The new approaches to production and use of visual aids, included in the universal artwork principle; the 6W [2] formula for projection of visuals, with its corollary consideration of seating, screen size, and viewing angle; selective switching of light to permit proper illumination; legibility standards; use of full-size linotype-set transparency copy; use of the "magic wall" projection-white chalkboard; improvement of equipment and its application; and further development of "black-lite" applications.

Universal Artwork Principle and 6W Formula

While primarily applied to projected visuals, the general principle of universal artwork is equally effective for material viewed by reflected light. Briefly, the same artwork properly prepared can be used for publications, directly viewed graphic visuals, and projected visuals. Artwork preparation is simply based on the 6W maximum viewing distance formula, and use of artwork with a rigid height-width of 1:1.32. Viewing conditions are adequate in all classrooms at the College, and several minimum acceptable standards were adopted [3] with the result that the instructor need never give second thought to whether his aids, properly used, are visible to all his students.

Classroom Lighting

In all classrooms, the auditorium, and the briefing room, lighting control is provided by selective switching of fluorescent lights or dimming of incandescent lighting. (The selective switching gives four conditions: (a) all on, with 48 foot-candles on the tabletops; (b) medium high, 25 to 30 foot-candles, suitable for reading without material lessening of effectiveness of overhead projection of simple line black and white transparencies; (c) medium low, 12 to 18 foot-candles,

[2] *"W" refers to the longer dimension of a viewed image. For example, a 6W viewing distance for the nine-foot image typical of College classrooms would be 54 feet. Ideally, no one should be closer than two image-widths, nor farther than six image-widths, from a visual viewed either by projected or reflected light.*

[3] *A screen image or chart with a long dimension one-sixth the distance from screen or panel to farthest viewer is ideal, and the College goal. A value of one-eighth is tolerable. Persons are never seated nearer the screen or chart than one image-width; two widths is the goal. On basic artwork, 9.5 by 7.2 inches, a 5/32-inch minimum letter height is used. For artwork in other sizes, but in proper proportion, a table of proportionate sizes for letters and other items to be discriminated is used. Matte front-surface screens, wide-angle rear projection screens, and quality chart paper are used; these permit viewing anywhere within an included angle of 90 degrees. On the screen or chart, letters or terms to be discriminated are at least one-inch high for each 32 feet of viewing distance.*

suitable for cursory reading, and projection of mixed black and white and line color diagrams, and black and white photographic material in high key; (d) lights out, less than one foot-candle ambient light on the projection surfaces, with the audio-visual blinds drawn—suitable for most full color transparencies, slides, movies, and opaque projection.)

Projected image brightness is maintained at least twice as great as any area in the field of view, and the light on sur-

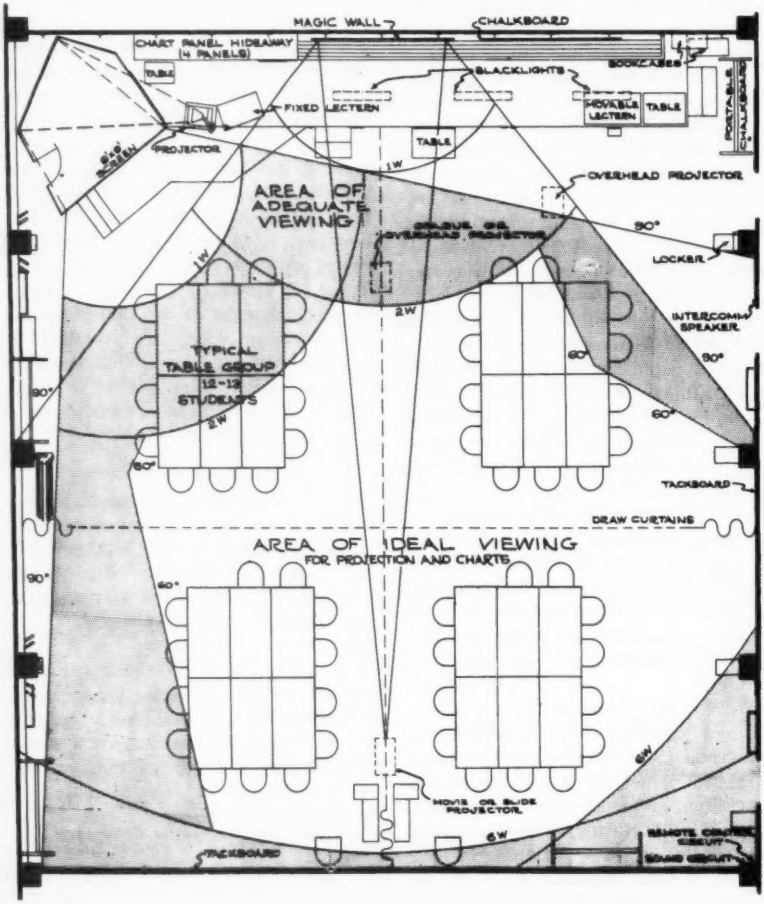


Figure 3. Application of the 6W formula in a typical classroom

Students in the central clear area have "ideal" viewing of both projection and chart surfaces; those in shaded area have "adequate" viewing. No student is more distant from any visual than six times the width of the image area. Projected and chart letters are at least one and three-fourths inches high.

faces to be viewed by reflected light is kept equal to or somewhat greater than that falling on other surfaces in view, by means of panel lights and spot and flood lighting. Direction of all illumination is such that minimum surface glare is produced. Thus potential distractions are eliminated.

Attention is given to the reflective properties of walls, ceilings, and floors as well as to tabletops, and, indeed, to the very color scheme of the rooms, since these affect the learning atmosphere.

Full-Size Type-Set Transparencies

While the College had for some time used type-set transparencies, copy had been set in small point size and "blown up" photographically. The resultant loss in sharpness of image and cost in time of the intermediate process often became prohibitive. Therefore, simple, bold, medium condensed type face in proper sizes for titles, subtitles, and text was obtained for the linotypes. Composition is proofed on translucent material to give a clear black positive, which is then reproduced on a dye image on a clear, transparent plastic base called a "diazochrome" foil transparency. Selective use of multiple proofs gives effective multicolor transparencies when necessary. Usually, however, this type of transparency is restricted to red titles and black text. The over-all production time was shortened for high quality aids, subject, of course, to availability of linotype time, often a consideration during critical printing periods.

"Magic Wall"

The large panel chart had long been a popular and effective aid for protrayal of terrain and tactical situations at the College and the only logical way to present such material. Silk screened in multicolor, these charts were produced at varying costs, depending on the quantity of each and amount of color. Many served simply as a medium upon which the student placed solutions—with colored pencil, chalk, or magnetic or pin up aids. Frequently, these copies of large, carefully prepared charts were then discarded. Where possible, charts were reused year after year with minor change, but the 100 percent rewrite for the 1957-58 academic year presented a massive production problem. *Since it was not possible to produce all the new charts required with the time and people available*, the College, therefore, turned to the "magic wall" principle. Liaison with industry, begun in the fall of 1955, had resulted in the discovery of the production of a projection-white porcelain enamel-on-steel chalkboard, used floor to ceiling, with blue chalk and a special wide-angle overhead projector. In 1956 experiments had begun at the College and after much testing and a year of effective use an improved product was specified for the new classrooms in Bell Hall.[4] As the second large-scale user of this multipurpose material, the College has worked with industry to improve the surface, chalk, and erasers. "Blacklite" applications have been added to make the "magic wall" a truly versatile visual aid.

Two large "magic wall" surfaces have become standard fixtures in each College classroom. Special deep tone chalk, charcoal, and fluorescent lecturer's chalks are used effectively to combine on one surface, projection, writing, magnetic aids, and "blacklite" applications, all the elements needed to gain and keep attention and to illustrate a presentation. Projected terrain transparencies cost about one-sixth the labor and material required for large silk screened charts—an important economy as opposed to charts which are used for short time display and "throwaway." Additionally, the board permits variety and a change of pace in instruction; it also serves as a surface upon which student solutions can be displayed with a minimum of effort.

[4] "Ad Bellum Pace Parati (*Prepared in Peace for War*)," Military Review, *March 1959*.

Facilities for Larger Audiences

Classrooms at USA CGSC were specifically designed for use of instructor-operated audio-visual aids to instruction. The auditorium and briefing room, on the other hand, are intended for mass communication techniques such as the lecture where it is necessary to cover broad general subject matter in a short time. In such instances, the size of the audience justifies assistance to the instructor. These facilities are designed to accommodate most every type of audio-visual aid. Instructor support includes as many of the following as are required: stage manager, for control of the numerous audio-visual panels, three screens, masking curtains, and other stage rigging; electrician, for control of the electronic switchboard and stage lighting equipment; soundman, for control of the public address and related sound system; slide projectionist, able to use all types of slides in a highly efficient arc projector, often without rehearsal for guest speakers, and able to change lenses for varied aids; motion picture projectionist, able to project CinemaScope, regular 35-mm, or 16-mm color or black and white

Figure 4. "Magic wall" in use

Terrain is projected in color, unit symbols are written with colorful "blacklite" chalk. The arrows are movable, being appropriately colored cardboard with small strong magnets on the back.

motion picture film, using arc projectors and both optical and magnetic sound. When not performing their principal duties, these technicians engage in maintenance and repair activities.

For rear screen use in the auditorium, twin 15-foot-square images or superimposed images are possible, using high intensity wide-angle slide and dimmer-equipped overhead projectors. A special 4 by 5 inch slide projector and a Linnebach projector also are available. And for the most evenly lighted projection maximum wide angle viewing, and minimum interference from changing front light levels, a special Polacoat rear projection Lenscreen is used. It is possible to use overhead rear projection in a fully lighted auditorium with a lighted forestage which results in a versatile combination.

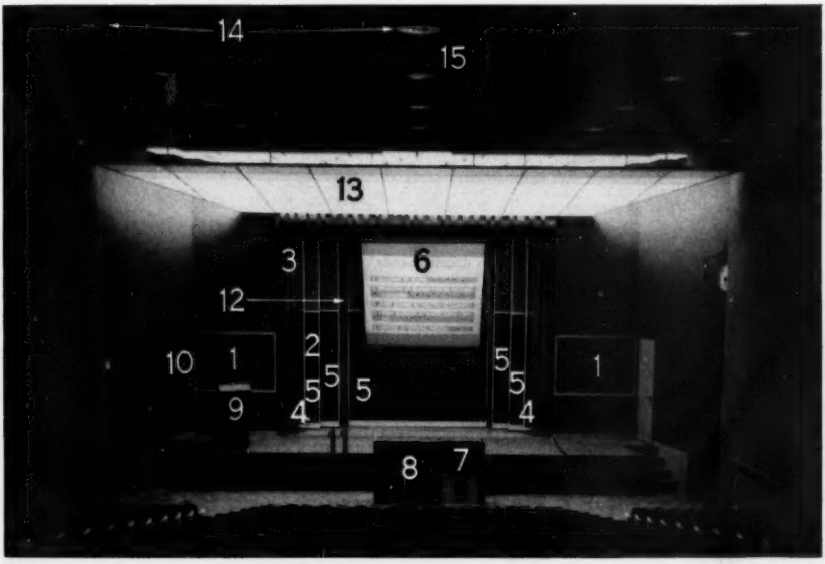


Figure 5. Staff and faculty briefing room, with capacity of 323

The facilities shown are: (1) installed steel chalkboard; (2) chalkboard on panels; (3) front curtain; (4) electromagnetic chart panel set; (5) six chart panels usable singly or in three sets of two; (6) tiltable screen for instructor-operated overhead projection (two, side by side, can be used for comparison images); (7) lectern with control switches, usable anywhere at front of room; (8) one of two lectern side wings for overhead projectors; (9) adjustable TelePrompTer lectern; (10) stage switch panel for light and visual aids control; (11) blacklite recessed in floor; (12) 14 foot by 20 foot "magic wall" projection white chalkboard; (13) panel fluorescent lights; (14) dimmable incandescent house lights; and (15) low-level sound speakers. Not shown are a 15 foot by 20 foot matte surface electric slide and motion picture screen, behind valance; spotlight niche in ceiling with six dimmable spotlights. Projection booth at rear is equipped for 35-mm and 16-mm motion pictures, remote or operator-controlled slides, and long-throw transparency projection, "follow" spotlight, lighting control, and sound recording and public address equipment, which will accommodate AM-FM radio, tape, or records at three speeds.

Audio-visual Media Used

In most cases, aids chosen by the instructor will be used by him to better advantage than those selected for him by audio-visual specialists. It is futile to lay down arbitrary rules for selection of aids. It is essential, however, to establish standards of production and use, and to ensure the visual effectiveness of the chosen aids. Upon occasion, elaborate and colorful aids are required, aids made to the highest graphic standards, but often a simple aid is the most effective.

The College uses a wide variety of aids to include the following:

Chalkboard.—Chalkboard lends itself to effective demonstrations and requires but little talent for drawing. The presentation

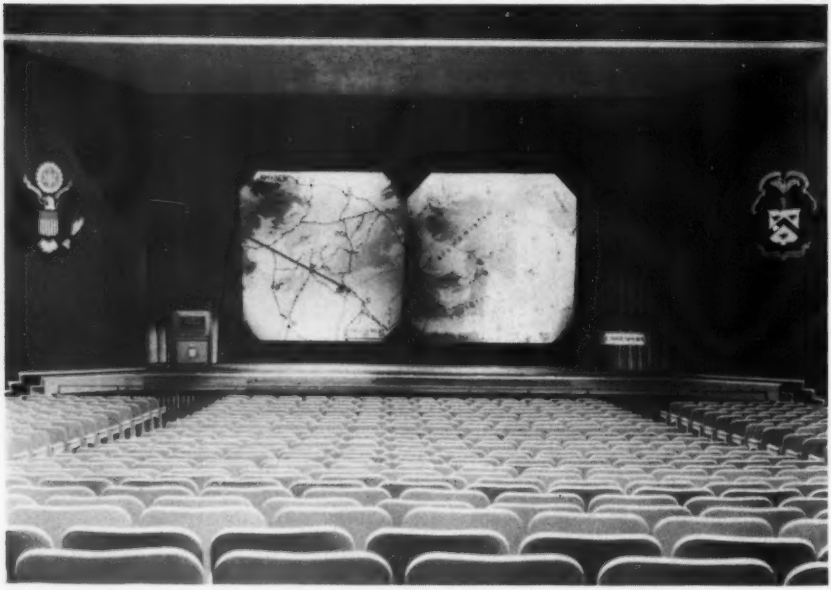


Figure 6. Bell Hall auditorium

Stage with movable lectern left, and two 15-foot-square rear screen images projected from overhead projectors backstage. The working area of the stage is 76 feet wide by 37 feet deep, with a proscenium 40 feet wide and 20 feet high. Thirty-seven sets of counterweighted lines carry grand valance, lift curtain, show curtain, tormentors (front vertical masking curtains), four light battens, CinemaScope, motion picture and slide, and rear projection screens, three sets of chart panels, a set of electromagnetic drop-off panels, necessary teasers (horizontal masking curtains), and tab legs (back vertical masking curtain), sound horns, sky cloth, two screen curtains, and essential spare line sets. Adequate electrical lighting and sound systems are provided, and an orchestra pit in front of the stage ensures proper minimum distance from the principal audio-visual surfaces to the front seats. The projection booth is equipped with 35-mm and 16-mm motion picture projectors, an arc slide projector, and an arc spotlight. Sound and main lighting control consoles are located in the projection booth area overlooking the stage. Adequate chalkboard, both green and projection-white, is provided, as are blacklite, spot lighting, and general lighting. Auditorium lighting level can be varied from an average of 20 foot-candles to darkness. Comfortable seats for 1,425 persons are provided.

can be paced to suit the situation and a high degree of student participation can be obtained, for the chalkboard is an excellent medium for student demonstration. The chalkboard, all of it magnet-responsive, is of two types—the green board, for use with ordinary white and yellow and fluorescent lecturer's chalk, and the aforementioned projection-white "magic wall" chalkboard. All classrooms are equipped with ample green chalkboard and "magic wall," and in each classroom work group area, large double-surface, *portable* green magnet-responsive chalkboards are used. These boards are equipped with accessory hardware to handle easel (flip) and poster charts and thumb-tacked items, and to accept roller type window shades for masking and timely disclosure of information prepared before class.

Charts.—A paper chart is preferable to a projected aid if it is to be displayed for extended periods of time. Each classroom is equipped to handle four large panel charts, and any number of easel or poster charts. Choice of an easel chart, a wall chart, or a poster is governed by the convenience to the instructor, the amount of information to be shown, and the number of charts to be used.

Graphs.—Graphs depict numerical or pictorially quantitative relationships. Two kinds are used—statistical and mathematical.

Maps.—The basic problem of depicting the varied, boundless, rounded surface of the earth on a single-plane graphic is a difficult one, and has resulted in the development of many kinds of map projections and many types of maps. Both Army Map Service sheets and multicolor composite maps, locally prepared, are used extensively. These are supplemented by terrain and situation charts, transparencies and slides of suitable size and design, and plastic relief maps.

Diagrams.—Diagrams are visual descriptions that explain rather than represent. One might show, for example, how to select a weapon for a particular task or how to draw a logarithmic scale.

Projected visuals.—A variety of projection equipment is available, but the overhead transparency projector is the most widely used method of visual communication. Although most projection techniques while in use tend to replace the instructor, the overhead projector complements his efforts. The instructor controls the equipment at all times, and there are no signals or instructions to an assistant to complicate the presentation. The instructor faces his audience; projection light is sufficient so that only partial room darkening, if any, is required even for colored transparencies. Thus he may observe audience response, appropriately adjust his program, and select his own pace before, during, and after projection. He can alter sequence or return to a previously used transparency at will. The large projection stage and transparency size permit use of writing, drawing, progressive disclosure, and composite image techniques directly on the artwork. Pointers can be used readily and with the exception of opaque projection material, transparency artwork is the easiest and cheapest of all to prepare. The following projection materials are used:

1. *Transparencies.*—The classrooms are equipped with special instructor-operated overhead transparency projectors for use on rear projection screens, and with normal and wide angle "Vu-graphs" for use on the "magic wall." Special projectors are used for the extra large images frequently required in the auditorium and briefing room. *Visamatic*[5] and *Technima-*

[5] *The* Visamatic *process uses the special properties of plane-polarized light to sharpen relief, drop out backgrounds, fade information in and out, and generally bring about transitions in story images on slides and transparencies that have been treated with* polaroid and bifringent materials. *A calibrated disk which can be rotated by hand is placed in the optical system near the projector lens. The process is costly in terms of light loss and does not lend itself to mass-produced projectibles, nor to use with foil transparencies.*

tion,[6] now in use for special purposes, will be introduced into certain classrooms next year to provide the added advantages of limited animation, dramatic emphasis, and selective pinpointing of information.

2. *Slides.*—Both lantern and 35-mm slides are used. Automatic instructor-operated, reversible, classroom 35-mm slide projectors are available to permit the broadest possible classroom use of slides available from individual students or instructors, as well as College-prepared slides.

3. *Opaque materials.*—The opaque projector is used to project nontransparent flat material of all types, including pages in books. These projectors provide sufficient screen brightness for a large screen image in darkened rooms. Material that is as fresh as the morning newspaper or the weekly magazine may be used this way, and there apparently is no copyright problem, since the material is not being reproduced in permanent form. Most projectors have an integral pointer which permits identifying particular points of reference, or critiquing student papers or drawings. Careful selection of material is emphasized to enable projection to proper legibility standards for the classroom in which used.

4. *Motion pictures.*—The motion picture is an extremely effective audio-visual aid. Editing can manipulate time, space, and objects; distractions can be eliminated and relationships emphasized. Movement and change, and in some cases color, attract the viewer and hold his attention. Films appeal to two of the senses and give the audience a realistic portrayal of many phases of military training that could not be made available without the use of expensive operational equipment, lengthy rehearsals, and considerable preparatory time. Procedures can be demonstrated at normal speed or slow motion. However, a film is used only when no other teaching material can be used more effectively. For reasons of economy, slides and film strips are used when they will make the point equally well. Films are never used to replace the instructor, but rather to supplement his efforts, and are carefully selected, previewed before use, and integrated into the framework of the lesson.

Use of composite films is an important College audio-visual technique—taken with or without sound from training films, prepared from stock or raw footage, or combinations of all of these. If desired these are "striped" so that a new locally prepared sound track can be added. Films are effective in the classroom environment, and when used for less than 20 minutes total running time, or as short clips interspersed with verbal presentation, multiple copies for simultaneous use in up to three classrooms at a time are considered justified. For longer runs, or larger audiences, students are moved to the auditorium or briefing room where formal presentation on a large screen is more economical. The Film and Equipment Exchange at Fort Leavenworth contains a large library of film subjects, many of which have been edited to suit author requirements for use with College Subjects. Authors select material of special interest by referring to the College film catalog. Instructional departments receive Instructor Film Reference sheets on the latest film releases. Navy, Air Force, and commercial listings are on file in the Film and Equipment Exchange for author study in connection with film selection. Established channels exist to the Army Pictorial Center, through which information relative

[6] Technimation *utilizes rotary polarization of light to add limited animation to otherwise static slides and transparencies. These projectibles are treated with prefabricated "tech strips," which provide varied motion patterns and speeds, and several special effects. These materials have pressure sensitive adhesive already applied. A motor-driven rotating polarizing filter is placed in the optical system near the projector lens. The process is costly in terms of light loss, does not lend itself to mass-produced projectibles, and is best suited to application on "negative" (dark background) projectibles.*

to the availability of film on any subject can be obtained.

Recordings and radio.—Talks by guest speakers usually are tape recorded, as are some conferences and special events. Tape player-recorders are available for use by staff and students for voice practice and rehearsals and are used in the classrooms for appropriate sound effects. Radio can be introduced into the classrooms on the intercommunication system, and into the auditorium and briefing room over the public address systems.

Photographs and displays.—Still pictures are used as a supplement to instruction. Approximately 30,000 filed photographs are available for use, and more are being added to the Archives collection daily. Upon request the College Archives obtains specific photographs for the instructor to suit his purpose. Selected pictures made into displays are of value to highlight key points of instruction, to arouse student interest, to simplify highly complex or technical information, to provide an opportunity for prolonged observation of objects, to arrest action, and to show an item when it is impossible or undesirable to display the actual object or model.

Exhibits and models.—Displays of actual items of equipment are used when it is desired to permit close observation and analysis and to arouse interest. Such displays are valuable in assisting students in visualizing equipment and devices.

Properties.—Properties and sets for skits, sketches, and historical examples are built to specifications.

Magnets and magnetic symbols.—Magnets are available in several shapes, sizes, and strengths for use with movable symbols. On the steel chalkboards and screen-covered chart panels they have proved far more satisfactory than other common systems for enabling the instructor to build a situation, or progressively disclose information. Electromagnetic drop-off chart panels are available in the auditorium and briefing room and permit rapid change and facilitate manipulation of aids that would otherwise be out of reach of the instructor.

"Blacklite."—Fluorescent paints, chalks, cardboard, and certain other types of materials, when excited by ultraviolet light, glow brilliantly in a dimly lighted or dark room. This effect is commonly known as "blacklite." Visible light is filtered out and only objects especially coated with fluorescent materials are visible. The materials fluoresce only when under the ultraviolet light and have no phosphorescent effect, so that when the light is switched off the fluorescent effect vanishes. This technique may be applied to panel charts, movable symbols, and chalkboards. All classrooms are equipped with "blacklite" for use to effect spectacular or instantaneous changes; to permit use of the chalkboard while using projectibles in a darkened room; for use in combination with projection on the "magic wall" where ordinary colored chalk or dollies would be lost in the color of the projection; and for emphasis.

Synthetic training devices.—Three-dimensional aids such as cutaways, operable large-scale models, complex electronic gear, mechanical evaluators, and simulated operational systems usually are known as special devices. The College has a limited number of these, including animated plastic transparencies.

Lighting effects.—Special stage lighting effects are available upon request.

Miscellaneous.—Many other types of aids, to include mechanical contrivances, edge-lighted plastic, special theatrical effects, terrain models, and mockups, can be built locally as required. However, the production of such aids is not justified except when necessary for instruction and when they cannot be displayed effectively by other means.

Instructional departments review each

Subject to ensure that it is fundamentally sound doctrinally, editorially correct, and properly coordinated with other Subjects. Reviews consider methodology and instructional aids employed to ensure the most effective method of presentation and the greatest economy consistent with instructional requirements. As an important economy measure, instructors are encouraged to use simple handmade aids for reviews, requisitioning final art and presentation copies only after approval of the methodology and instructional aids plan.

The issue plan, submitted 15 days prior to initial presentation of a Subject, lists instructional aids services required. Particularly films, projectionists, and special equipment are listed to ensure their readiness at the time needed.

Rehearsals are always conducted prior to a resident presentation. If assistance is desired for the rehearsal, a "Rehearsal Schedule and Requirements" sheet is completed at the time the rehearsal space is reserved.

Future Planning

Just as organization, doctrine, and instructional methods are in a constant state of transition toward further improvement and modernization, so are instructional aids. Having taken very significant forward steps the College will continue to refine and improve its audio-visual program. This will be done by aggressive local development of materials and techniques, and continued liaison with civilian educational institutions, where appropriate, and with the audio-visual industry. New ideas and equipment will be examined and will be used only if effective by College standards to support current methods of instruction. The goal is to remove the technical shackles that would tend to bind the imagination of the instructor . . . to give him whatever he wants—certainly whatever he needs, in support of his instruction.

Plans for the future include further development of *Visamatic* and *Technimation* applications; procurement of an especially prepared very large plastic relief terrestrial globe, for many uses, including the making of projectibles, and as an audio-visual and for use with television; further development of chalk and erasers for the "magic wall"; and the use of television.

A system for use of television as an instructional medium was designed and approved on 26 July 1957, and the prospects for closed circuit television in Fiscal Year 1960-61 appear encouraging. Used as an instructor controlled teaching tool, television should assist the College in its broad program of keeping pace with the future.

Summary

The audio-visual program has grown and developed along with other phases of College activities these past several years. And like them, it has been constantly evaluated to determine its effectiveness. Judged by the generally excellent student reception as evidenced by numerous favorable comments, and the individual comments of distinguished visitors and members of the staff and faculty, the program is accomplishing its mission. The search for improvement is ceaseless, and orientation of the program must undergo continuous reappraisal to ensure operational compatibility with the ever-changing situation and improving methods of instruction. The College cannot and will not become complacent in this regard.

So long as the College Audio-visual Center, Instructional Aids Branch, continues to provide varied and versatile materials, dependable equipment, and timely assistance to the instructor, it will enjoy a prominent place in the Leavenworth scheme of things—with a reputation for helping the instructor to communicate ideas to the student, and for making the student learning experience more lasting and meaningful.

MILITARY NOTES AROUND THE WORLD

UNITED STATES

Weapons Tested

Among the various small arms weapons systems under test by the Army are a .22-caliber, high-velocity round; single, duplex, and triplex rounds in various caliber; and flechettes. The experimental .22-caliber round, which has a velocity of 4,500 feet per second, has been tested against a block of gelatin having the consistency of flesh and disintegrated the target on impact. The duplex and triplex cartridges fire two or three jacketed balls instead of the conventional one. With this limited application of shotgun technique it is said that less accuracy of fire is required and a greater chance of getting a hit is expected. Flechettes also are under serious study. These are tiny darts so small that about 32 can be packed into a 12-gauge shotgun shell and fired with practically any desired velocity. They depend on their length and fins to give them ballistic stability. Exact design of the flechette is classified, but they are not made of conventional material.—News item.

Cross Training

During Fiscal Year 1960, 120 warrant officers, previously schooled only in helicopter operation, will be trained in flying fixed-wing aircraft at Gary Army Air Field, Texas. Only helicopter pilots, who have been rated for at least three years, are slated for this cross training. It also has been announced that officers, who were required to be fixed-wing qualified before they could apply for training in helicopters, can now apply for helicopter training first, with fixed-wing cross training to follow if they prefer. In addition to qualifying six classes a year of 20 warrant officers for their second rating, 17 classes of officers in primary training will be enrolled at the Army flight school during 1960. The size of the officer primary classes is to be reduced from the present 65 to 52.—News item.

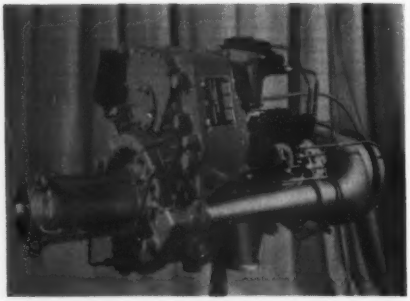
New Carrier Classification

A new carrier classification, AVT (auxiliary aircraft transport), has been introduced by the Navy. The AVT's will not be a new class of ships, but the classification will be given to a number of small aircraft carriers of the CVL type and antisubmarine warfare support aircraft carriers (CVS). The Navy also has changed the hull numbers and classification of 36 utility aircraft carriers (CVU's), escort aircraft carriers (CVE's), and escort helicopter aircraft carriers (CVHE's) to AKV's (cargo ship and aircraft ferry). All the latter vessels are in the reserve fleet.—News item.

XUM

Gas Turbine Powerplant

Testing programs are under way on the *T63-A3* gas turbine powerplant which is expected to have a wide range of applications at the 250-horsepower level. The lightweight turboshaft engine is said to be especially designed for aerial jeeps, drones, light helicopters, and any other application where portability, lightweight, and high output are of primary concern.



Lightweight *T63-A3* turboshaft engine

It delivers its 250 horsepower to the propeller hub at 2,000 revolutions per minute. The mechanical arrangement is such that two of the engines can be geared together, providing a 500-horsepower unit.—Commercial source.

Airborne Ditchdigger

An airborne mechanical ditchdigger, capable of digging a trench four feet deep and 24 inches wide at a rate of 12 feet per minute, is under test by Army engineers. The highly mobile ditcher is mounted on rubber tires and is capable of road speeds up to 35 miles an hour. The machine is designed to support earthwork operations on construction projects, and to provide quick protection for troops. In the latter role it can dig ditches to a depth of six feet, excavate a foxhole in one to two minutes, or dig a machinegun emplacement in five to 10 minutes.—Official release.

Cargo-Personnel Carriers

The experimental aluminum *XM443E1* cargo-personnel carrier now under evaluation by the Army and Marine Corps is said to have all the ruggedness and versatility of the *M38A1* jeep now in military use. Although it weighs less than the *M38A1*, it has a considerably greater load capacity. It weighs 4,400 pounds, and has the highest load ratio to total weight of any tactical military vehicle in its class.

The wheelbase of the *XM443E1* is 80 inches, and tread width is 57 inches. It uses four-wheel drive and optional two- or four-wheel steering. Designed for use on or off the highway, the vehicle has a

The *XM443E1* is under evaluation tests

top speed of 65 miles an hour and can climb grades up to 60 percent. It has individual wheel suspension, a removable cowl with a windshield that retracts into the cowl, and a full canvas cab enclosure. It is powered by a 100-horsepower air-cooled aluminum engine that is mounted under the platform of the vehicle.—Commercial source.

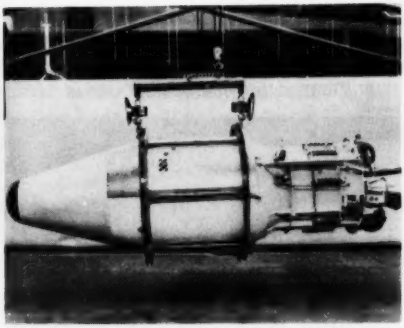
Space Engine

Research is in progress on an engine of revolutionary design for use in space vehicles. The device, called a magnetic pinch plasma engine, turns a heavy gas such as oxygen into ions and electrons, compresses these by magnetism, and shoots them out the rear of the engine at an extremely high velocity.—News item.

'Discoverer' Satellites

The *Discoverer* satellite program plans for the first launchings to be for the purpose of testing the satellite and its propulsion and guidance systems. Later satellites will carry live animals and their recovery attempted. *Discoverer I*, launched in February 1959, was boosted to altitude by a *Thor* intermediate range ballistic missile on a north to south orbit and was 19 feet long by five feet in diameter, and weighed about 1,300 pounds.

Discoverer II had an orbiting weight of 1,600 pounds. Gross weight at launch was approximately 8,400 pounds, about 1,400



***Discoverer* satellite prior to launching**

pounds heavier than *Discoverer I*. Satellites of this series use a small, but powerful liquid fueled engine to accelerate the satellite to orbital velocity.

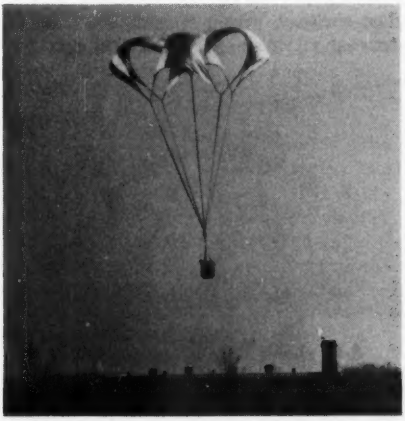
Discoverer II has been called the world's first controllable satellite, using gas jets which cut in and out to keep the satellite at the proper attitude position. The satellite compiles data on more than 100 items of performance to be radioed back to earth over the telemetry system.—Commercial source.

Liquid Hydrogen Fuel

An advanced rocket fuel, liquid hydrogen, is said to be almost three times as powerful as present fuels. Previously available only in limited quantities because of difficulties in manufacture, storage, and handling, the potent fuel is now in production.—News item.

Vortex-Ring Parachute

The Vortex-Ring parachute is made of four flexible cloth panels which rotate about an axis as the parachute lowers its



Vortex-Ring parachute in field test

load to the ground. Nylon suspension lines run from the corners of the panels and are gathered together at a swivel below which the load is attached. The rotating panels are said to give the highest drag efficiency of any parachute ever built.

The Vortex-Ring parachute has only 40 percent of the panel material of a solid canopy parachute capable of the same performance, but permits landing with one-half the impact shock of the conventional model. Other advantages are said to be its lower weight and bulk, absence of oscillation, low opening and landing shock factors, pinpoint accuracy, and immediate collapse upon landing. Models of the Vortex-Ring parachute are under test by the Army, Navy, and Air Force.—News item.

Crane Helicopter

The *S-60* crane helicopter, said to represent a radically new concept in aircraft design and use, has no conventional passenger or cargo cabin. The fuselage of the aircraft consists of a bridge like boom extending from the cockpit to the tail rotor. Loads are carried externally by a hoist suspended from the structure at a point directly under the main rotor. The glass-enclosed cockpit provides unobstructed vision in all directions, and the

***S-60* shows missile age mobility**

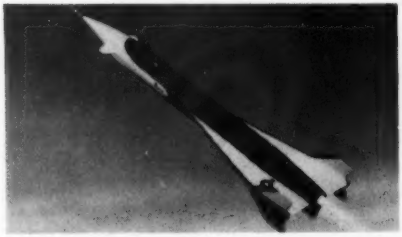
copilot's seat swivels 180 degrees to the rear with flight controls in both forward and aft-facing positions. This provides a clear view of loading and unloading operations, and permits exact placement of the helicopter for hoist work.

The *S-60* is powered by two 2,100-horsepower piston engines and can carry a load of four to six tons for distances up to 100 miles. The crane can be converted to gas turbine power which will increase its load capacity by an additional 5,000 pounds. Other crane models under design will have lifting capacities ranging from five to 50 tons. Detachable pods for the *S-60* have been designed to carry troops or passengers, or to function as emergency hospitals, communications centers, fire-fighting units, and many other uses. The *S-60* uses the same five-blade rotor system, transmission, and powerplants as the earlier *S-56*, which carries the Army designation of *H-37A (Mojave)*.—News item.

High-Speed Missile-Target

The designation of *KD2B-1* has been given to a low-cost missile-target with speed and altitude performance which matches the capabilities of enemy aircraft. The missile-target, which is expendable, will be used for the training of interceptor and fighter pilots firing radar-guided or heat-seeking air-to-air missiles. The Navy also plans to make use of the target in connection with ship-launched air defense missiles. The *KD2B-1* will be capable of level flight at any predetermined altitude from 5,000 to 70,000 feet. It will be able to fly for five minutes at Mach 2, or eight minutes at Mach 1.5.

A self-contained guidance system allows the *KD2B-1* to seek its preset altitudes and speeds for fighter pilot training problems. Planned for operational use in 1962,



The *KD2B-1* expendable missile-target

the missile-target will have a simple hit-or-miss scoring system, a self-destruction device, and is designed for all climatic environments.—News item.

Helicopter Cable Laying

A technique has been developed for laying a multichannel telephone cable at speeds up to 100 miles an hour. A special lightweight cable that can carry 96 separate two-way telephone conversations is used. The technique utilizes a compact package which hooks under a standard Army helicopter, and carries 10 miles of cable to be paid out in zigzag fashion to prevent snagging.—News item.

Missile Destroyer

The United States first destroyer built specifically to carry missiles has been launched and will be delivered to the Navy in 1960. The 4,500-ton *Henry B. Wilson*, which will have a top speed of 35 knots, will be armed with *Tartar* surface-to-air missiles. The *Wilson* will carry 42 *Tartar* missiles which are two-stage solid propellant surface-to-air weapons with higher performance than the version of the *Terrier* missile now operational with the US Navy. A total of 13 vessels of this type are provided for in the 1957 and 1958 Fiscal appropriations, and five more such warships have been requested.

It also has been announced that construction has started on the US Navy's first nuclear-powered guided missile destroyer leader. The new vessel, to be called the *Bainbridge*, will be armed with *Terrier* missiles and will have the most modern antisubmarine equipment. The 7,600-ton craft will have a virtually unlimited cruising radius at higher speeds than conventionally powered destroyers. It will be 540 feet long and 56 feet wide.—News item.

Navy Uniform Changes

The Navy has adopted a new "quick doffing design" work shoe for all enlisted personnel that will replace both the existing black service shoe and the field shoe. The new footwear has better traction qualities, is water resistant, and has only two sets of lace holes instead of the seven sets of the present work shoe. The new style will not be available until existing stocks of shoes are depleted.

Another change due for early incorporation is the adoption of a tropical white shirt for enlisted men. The white shirt, which is a V-neck, open-throat design with short sleeves, is similar to that previously authorized for officers and chief petty officers in warm weather areas. It is prescribed for wear with the regular undress white trousers and white hat.—News item.

Nuclear Blimp

A nuclear-powered missile-launching nonrigid airship, about three times bigger than the largest airships now in use, has been proposed. The big blimp would have an envelope with a capacity of 4.5 million cubic feet of gas and be 540 feet long. The 86-foot control cabin of the big airship would provide accommodations for 24 officers and men. The nuclear powerplant of the aircraft would drive turboprop engines giving it a speed of approximately 80 knots, and the engines also would be capable of operating on chemical fuels during landing and takeoff to reduce the danger of contamination. The length of the airship would permit the nuclear reactor to be placed so far behind the control car that radiation danger to the crew would be minimized. No official announcement on the acceptability of the proposal has been made.—News item.

Warship Modernization

During the next five years the Navy's Fleet Rehabilitation and Maintenance (FRAM) program will modernize and prolong the useful life of 255 World War II vessels. In the FRAM program, which will cost a little more than 1.5 billion dollars, are 163 destroyers, 35 submarines, six antisubmarine warfare carriers, and 51 amphibious ships, destroyers, and submarine tenders. Both the *Boxer* and *Princeton*, now in use as helicopter carriers for the Marine Corps landing forces, are in the FRAM program.

The modernization will include long-range sonar equipment, combat information centers, and an antisubmarine helicopter for destroyers; attack centers in submarines; and long-range airsearch radars in many vessels. All will have improved communications systems. The program, which will extend the life of some vessels by five years and others by eight, is to get under way during the current fiscal year.—News item.

XUM

FRANCE

Hypersonic Bomber

The first prototype of the twin-jet delta-wing *Mirage IV* is in the test flight stage. This aircraft is derived from the *Mirage III* (MR, Aug 1958, p 73), and is powered by two *Atar 9* engines having a thrust of 13,250 pounds each with afterburner. The prototype weighs 25 tons, and is the first step toward the final version which will

Twin-jet *Mirage IV* prototype

weigh about 48 tons and be powered by two engines of 30,000 pounds thrust each. The *Mirage IV*, which is called a piloted strategic armament system, will be in the Mach 2 class.—News item.

Warships Launched

Warships recently launched for the French Fleet included the LST (landing ship tank) *Trieux*, and the submarine *Morse*. The *Trieux* is the first of three planned LST's, all of which will have the following characteristics: displacement light, 1,765 tons; length, 100 meters; speed, 11 knots; radius of action, 18,500 miles; crew, 85. These vessels each carry four experimental LCVP's, (landing craft, vehicle, personnel). This type vessel, derived from the United States LST's, has a cargo capacity of about 1,800 tons and can carry as many as 335 passengers on short-range ferrying operations.

The submarine *Morse* is the last of six ocean-going vessels of the *Narval* class (MR, Oct 1957, p 69) to be launched, the others being *Narval, Marsouin, Dauphin, Requin*, and *Espadon*. These underseacraft displace 1,450 tons, and have a surface speed of 16 knots and a submerged speed of 19 knots. They are armed with eight torpedo tubes and carry 14 reserve torpedos. The *Narval* class vessels are improved versions of the German *XXI* type, and were constructed in prefabricated sections.—News item.

Nuclear Generator

France's first commercial nuclear-generated electricity is being produced by a graphite-moderated reactor at the Marcoule nuclear center in southwestern France. In initial operation, the reactor produced 9,000 kilowatts of electricity and has an ultimate planned output of more than 25,000 kilowatts. This reactor, like that earlier reported (MR, Oct 1956, p 71), was designed primarily to produce irradiated uranium from which plutonium could be extracted. France's main effort in commercial production of electricity from nuclear power is centered at Chinon in the Loire Valley. The initial capacity of the Loire Valley installation is expected to be about 60,000 kilowatts, with probable expansion to 300,000 kilowatts. It is scheduled to be in operation late in 1959 or early in 1960. By 1975 the production of nuclear-generated electricity in France will amount to one-quarter of the total national consumption.—News item.

Acceleration Tests

Jet aircraft engines are subjected to catapulting acceleration tests on a half mile of special railroad track. The engine to be tested is placed on a special chassis which is accelerated to six times the force of gravity, and a speed of about 150 miles an hour. The chassis is decelerated by a hydrodynamic system using water in a tank located below the track and by mechanical brakes.—News item.

BRAZIL

'Humming Bird' Helicopter

The first Brazilian-designed and built helicopter, the *Beija-Flor 1*, or *Humming Bird*, features two three-blade intermeshing tail rotors set at an angle of 45 degrees. These are actuated in blade angle for both lateral and elevator control. The tail rotors are supplemented by a V-shaped fixed-wing aircraft tail assembly, the vertical surface of which extends downward and also serves as an emergency tail landing skid. The 225-horsepower engine of the *Humming Bird* is located under a forward cowl, somewhat like in an automobile. The three-bladed main rotor is driven through a worm gear transmission. The *Humming Bird* was developed and test flown at the Technical Center for Aeronautics in Sao Jose dos Campos, northeast of Sao Paulo.—News item.

CANADA

Icebreaker Plans

Canada is going ahead with the designing of an icebreaker which could be driven by nuclear power, although the final decision to install the nuclear reactor has not been made. The vessel will follow hull designs worked out in Great Britain. —News item.

Air Defense Bases

Canada will have two *Bomarc* air defense bases, one near North Bay in Ontario, and the other near Mont Laurier, Quebec. Original plans called for each base to be equipped with a normal squadron allowance of 60 of the *Bomarc* missiles, but plans now are for a reduced number of launchers and only about 30 missiles at each site. The *Bomarc* supersonic ground-to-air missile was selected as the principal weapon of Canadian air defense when the announcement was made of the cancellation of the *F-105 Arrow* interceptor aircraft (MR, Jun 1959, p 81). —News item.

PORTUGAL

Fast Antisubmarine Frigate

The *Pero Escobar*, a fast antisubmarine escort vessel built to the order of NATO for the Portuguese Navy, displaces 1,850 tons and has a top speed of 32 knots. Laid down in 1955 and completed in 1957, the *Pero Escobar* mounts two 3-inch antiaircraft guns and six light antiaircraft weapons. Other armament includes three

Portugal's frigate *Pero Escobar*

21-inch torpedo tubes and two *Squid* triple-barrel depth charge mortars. The Italian-built vessel carries a crew of 180.—News item.

COMMUNIST CHINA

Budget Increase

Red China's budget for 1959 is planned to balance at about 52 billion yuan, approximately 11 billion more than last year. The arms budget has been increased 16 percent over last year to 5.8 billion yuan or 2.5 billion dollars, as the Red Chinese count it. A yuan, according to Chinese standards, is worth about 43 cents in United States currency.—News item.

USSR

Nuclear Battery

Soviet scientists have reported the development of a high-voltage nuclear battery shaped like a spark plug that can transform nuclear energy directly into an electric current of 24,000 volts.—News item.

XUM

All-Weather Fighter

The *Yak-25 Flashlight* all-weather fighter aircraft has been produced in at least three versions. *Flashlight A* is the original twin-jet aircraft first shown publicly in 1955, and has since been standard equipment with the Soviet Air Force. *Flashlight B* has a pointed glazed nose and is thought to be a light bomber. The cockpit on this model has been redesigned for a single occupant. *Flashlight C* has a pointed radome nose, as compared to the rounded radome of the *A* model. It also has a dorsal spine and its turbojet engines are fitted with afterburners. All three versions are powered by two *Lyulka* turbojet engines of 11,400 pounds thrust each. Their top speed is about 0.9 Mach. It has been reported that the *Yak-25* is being armed with a new air-to-air rocket with a range of 75 miles. Earlier rockets with which the *Flashlight* was armed were of the heat-seeking type with an operational range of slightly less than 50 miles. The *Flashlight* carries its rockets in the underbelly of the fuselage on a tray that is extended downward for firing purposes. —News item.

NATO

Missile Plans

The United States will spend 302 million dollars this year and next to equip her NATO allies with missile weapons systems. Ten missile units already have been delivered and activated by the NATO forces. Under the new program, 20 additional units of a complete family of missiles will be delivered by the end of the year. The 30 missile systems have been or will be delivered and put into operation by France, Germany, Turkey, Great Britain, Italy, Belgium, Denmark, Greece, the Netherlands, and Norway. The missiles include the *Honest John, Sidewinder, Hawk, Lacrosse,* and undisclosed intermediate range ballistic missiles.—News item.

Reduced IRBM Squadrons

The number of intermediate range ballistic missile squadrons scheduled for NATO has been reduced to eight—five *Thor* and three *Jupiter* units. Each of these squadrons is armed with 15 missiles. Four of the *Thor* squadrons are planned to go to Great Britain. An unreported number of units are scheduled to go to Italy who has become the second European nation to agree to the stationing of IRBM's on its territory as part of the Atlantic Pact strategy. The missiles will be manned by Italian technicians, with nuclear warheads kept nearby under American custody.

Other missile units presently in Italy include a special battalion of United States troops stationed at Vicenza. These troops are armed with *Honest John* and other short-range missiles, and are integrated into Italian Army detachments assigned to NATO forces. Turkey also has announced her willingness to have US IRBM's, but has not completed arrangements for them as yet.—News item.

WEST GERMANY

Nonrigid Airships

West Germany has a nonrigid airship, the *Trumnf*, which made its first flight during the summer of 1958. A second nonrigid airship, the *Underberg*, is scheduled for its maiden flights this summer.—News item.

GREAT BRITAIN

Underwater Escape

All British Fleet air arm jet pilots are being taught how to use ejector seats to escape from submerged aircraft. The gun which fires the seat from the aircraft is modified for use under water. Trials of this method of escape from submerged aircraft were begun in 1957, and tests have included escape from a jet aircraft's cockpit 40 feet under water.—News item.

Frigates Launched

Two more frigates have been launched for the Royal Navy, an aircraft direction ship and a *Whitby* class vessel. The aircraft direction frigate *Lincoln* is the fourth of five planned *Salisbury* class vessels. Others previously launched include the *Salisbury*, *Chichester*, and *Llandaff*. The *Lincoln* is 340 feet long and displaces 2,185 tons fully loaded. The vessel uses eight diesel engines in its powerplant to drive variable pitch propellers, giving a top speed of 26 knots. The *Lincoln* is armed with two 4.5 and two 40-mm guns, and a *Squid* depth charge mortar. Vessels of this class are equipped with highly developed electronic gear and are designed primarily for the direction of carrierborne and shore-based aircraft.

The *Whitby* class warship is the *Yarmouth* antisubmarine frigate. This 2,800-ton vessel is powered by steam turbines and has a top speed of about 30 knots. Antisubmarine equipment consists of twelve 21-inch torpedo tubes, two *Limbo* three-barreled depth charge mortars, and the latest most modern devices for detecting and locating submarines and for the direction of antisubmarine aircraft. Six other *Whitby* class vessels are in service with the fleet, and a total of 18 are planned.—News item.

DENMARK

'Nike' Equipment

A complete set of *Nike* guided missile equipment, including radars, launchers, and vans, has been delivered to the 1st Danish *Nike* Battalion at the United States Air Defense Center at Fort Bliss, Texas, for transport to Denmark, where the battalion will become the first *Nike* unit in Denmark's air defense system. Members of the 149-man Danish battalion have been training on the *Nike Ajax* and *Nike Hercules* missiles at the U. S. Air Defense Center since early 1958.—Official release.

NORWAY

Plans for 'Terne'

Consideration is being given to a plan to produce three sets of the compact and effective *Terne* antisubmarine weapon system (MR, Feb 1959, p 69) for installation and testing aboard three Norwegian naval vessels by 1961. Under this plan the United States is to contribute 17,384,000 krone (approximately 2.43 million dollars) to cover the production cost, and Norway will pay for installation and rockets. Tests have shown the *Terne* system to be extremely effective, comparable to similar systems in other NATO nations, but requiring considerably less space and without the need for a special vessel.—News item.

MOROCCO

Army Reorganized

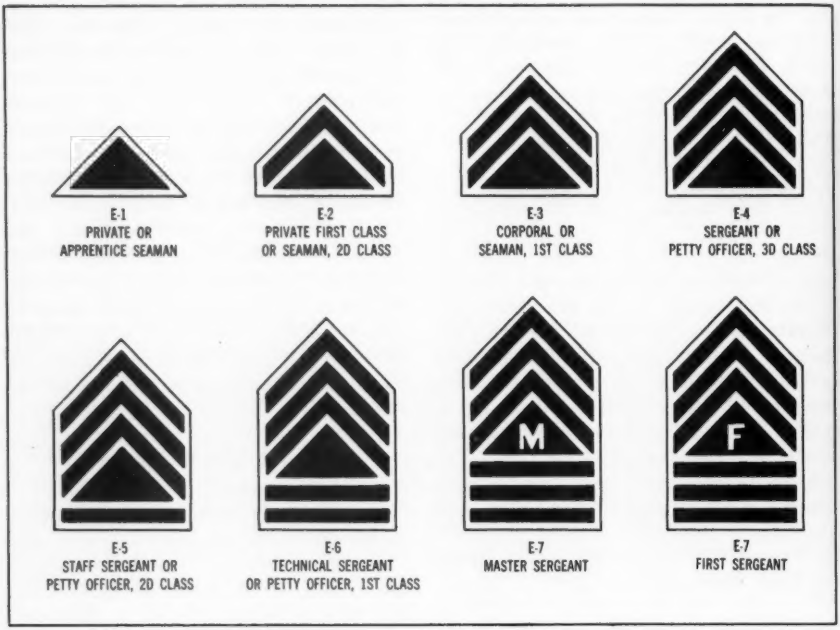
The Moroccan armed forces have been reorganized with emphasis on light mobile units. The army, formerly organized and trained in the north of Morocco under Spanish influence, and in the south according to French methods, has been unified under a single central command. A light artillery group also has been set up for use in regions where communications are particularly difficult.—News item.

INDONESIA

Aircraft Purchase

Fifty old-style combat aircraft and 10 modern turboprop transport planes are to be sold to Indonesia by the United States. These include 10 *C-130B* turboprop cargo aircraft, to be purchased directly from the manufacturer, and 15 *P-51 Mustang* World War II fighters from a private source. The United States Government will provide an additional 20 *Mustangs* and 15 *B-25* World War II propeller-driven bombers from surplus stocks.—News item.

PHILIPPINES



Armed Forces Chevrons

The design, color, detail, and specifications of the chevrons to be worn by Philippine enlisted men have been announced. Generally, they will be similar in design throughout the armed forces but will be of varying colors to differentiate between the services. The main feature of the sleeve insignia is a central triangle with stripes added above or below as the enlisted man is promoted. The triangle and stripes, regardless of color, are superimposed on a cloth background of the same material as the uniform on which it is worn.

The chevrons of the navy will be black on a white background for the white uniform and white on blue for the blue uniform.

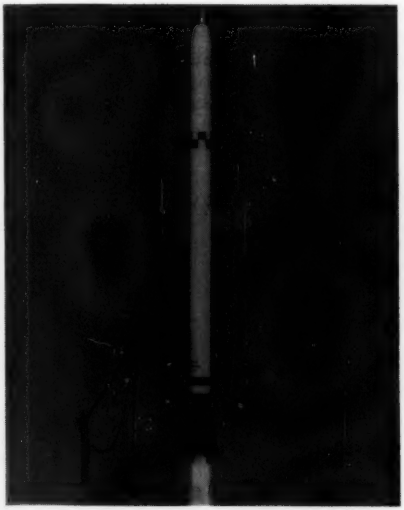
Chevrons of the marines will be black on a khaki background for khaki uniforms and blue on scarlet for dress.

The air force blue chevrons will be on gray cloth with an embroidered diamond-shape insignia in red, white, and blue. As the airman is promoted, stripes are added protruding upward from the sides of the diamond, forming a 90-degree angle, one stripe for private first class and two for corporals. Sergeants of the air force will have horizontal stripes of blue added to the top of the chevron.

The constabulary wears red stripes, while the chevrons of the Philippine Army are maroon. Rating symbols for all services, "F" for first sergeant and "M" for master sergeant, are embroidered in the center of the diamond or triangle in gold. —News item.

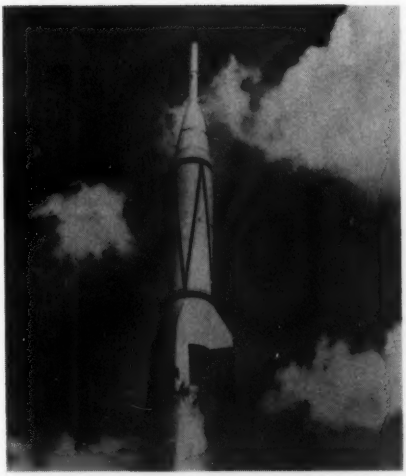
Army "Firsts" in Missiles and Space

Today's rapid strides in missile development tend to obscure the exploratory work that has made these later advances possible. In view of this, the following list of United States Army "firsts" in missiles and space is presented.



May 1947, United States Ballistic Missile Firing: **The first full-scale flight test of a *WAC Corporal* missile on 22 May 1947 was entirely successful. The missile was fired with the participation of the 1st Guided Missile Battalion, Fort Bliss, Texas, and United States Army Ordnance personnel of White Sands Missile Range, New Mexico. Fired at White Sands, the *Corporal* responded accurately to guidance controls and reached a range of 63 miles.**

February 1949, Penetration of Outer Space: **A two-stage missile, consisting of a German *V-2* with a *WAC Corporal* as the second stage, was fired on 24 February 1949 by Dr. Werner von Braun at White Sands Missile Range as part of the Army Missile Program. Army personnel of the 1st Guided Missile Group at Fort Bliss and United States Army Ordnance personnel participated in the firing of the missile which achieved an altitude of 250 miles, a world record at that time.**

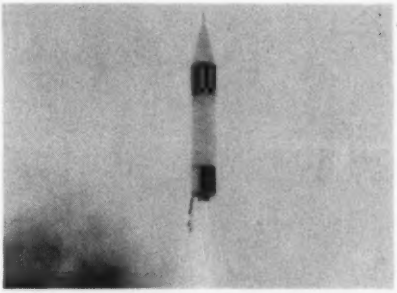


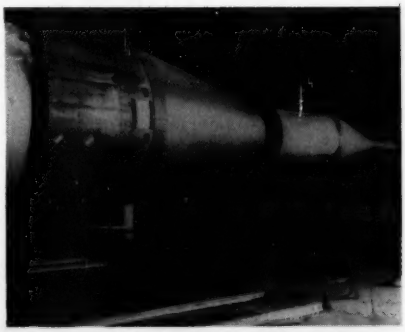
November 1951, Intercept of Aircraft by Guided Missile: The Army research and development contractor accomplished this on 27 November 1951 at White Sands Proving Ground with the first *Nike Ajax* missile fired at an aerial target. The target was flying at about 15 miles' range, an altitude of 33,000 feet, and at a speed of 300 miles an hour. The missile detonated about 25 feet from the target.

December 1953, Operational Air Defense Guided Missile Unit: The United States Army Air Defense Command (then called the Army Anti-Aircraft Command) placed the first operational surface-to-air missile system on-site in the Continental United States air defenses in December 1953. This unit, a *Nike Ajax* battalion, was deployed in the Washington-Baltimore defenses.

November 1954, Operational United States Ballistic Missile Unit: The Army's 259th Field Artillery Missile Battalion *(Corporal)* completed training at Fort Bliss, Texas, in November 1954 to become the first operational United States ballistic missile unit. This battalion was deployed to Europe in February 1955 to provide guided missile support for units in the Seventh United States Army.

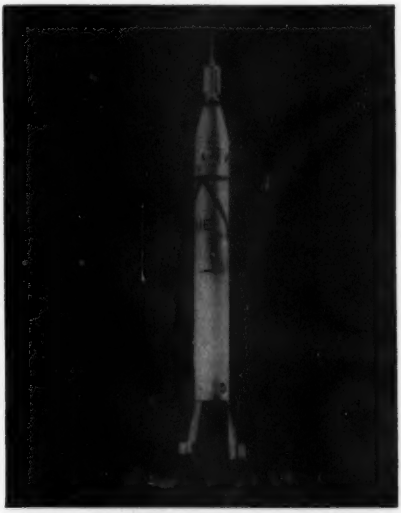
May 1957, Intermediate Range Ballistic Missile Fired: **A full-scale *Jupiter* missile, fired at Cape Canaveral, Florida, on 31 May 1957, was the first successful intermediate range ballistic missile of the free world. The firing was conducted by the Army ballistic missile team from the Army Ballistic Missile Agency and the Jet Propulsion Laboratory.**





August 1957, Solution to the Re-entry Problem: **A *Jupiter-C* missile fired at Cape Canaveral, Florida, on 8 August 1957 confirmed the first free world solution to the problem of missile nose cone re-entry into the atmosphere. Firing was conducted by personnel of the Army Ballistic Missile Agency and the Jet Propulsion Laboratory, both agencies of the United States Army Ordnance Corps.**

January 1958, Free World Satellite in Orbit: **The first free world satellite, *Explorer I*, was placed in orbit by a *Jupiter-C* missile on 31 January 1958. This project, a joint achievement of the Army Ballistic Missile Agency and the Jet Propulsion Laboratory, was completed only 84 days after the Army was given the mission.**



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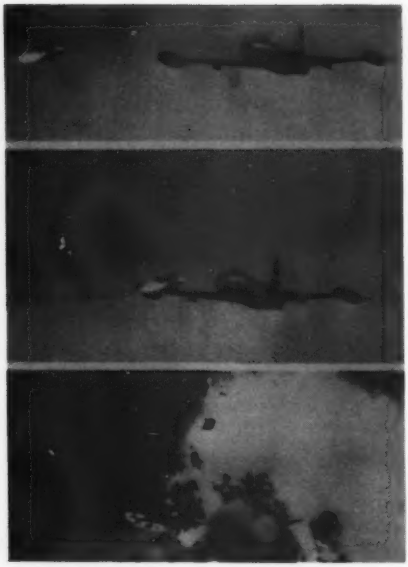
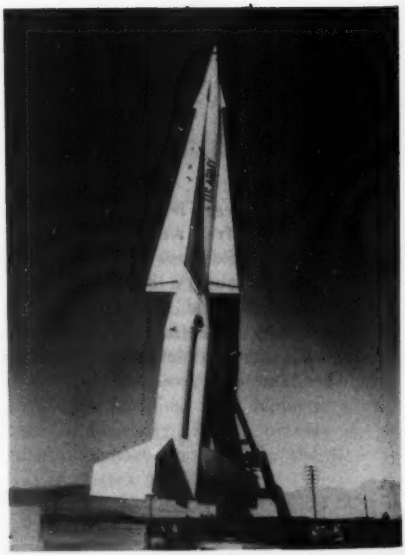
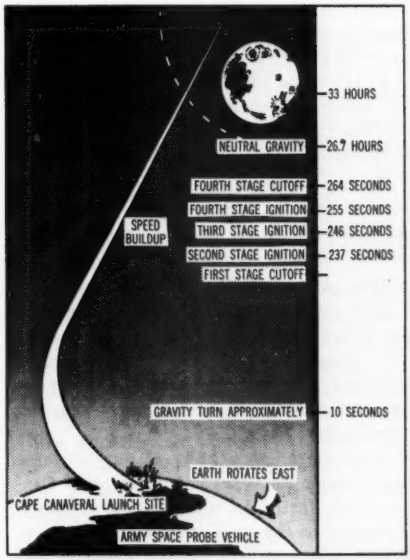


May 1958, Intercept of Very Low-Altitude Aircraft: **A *Hawk* missile fired by the Army research and development contractor during May 1958 successfully engaged an *F-80* jet target flying at treetop level at White Sands Proving Ground, New Mexico.**



November 1958, Highest Free World Intercept of a Target: **A *Nike Hercules* successfully intercepted a rocket-launched parachute target at an altitude in excess of 100,000 feet, and at a range of over 35 miles on 6 November 1958.**

November 1958, Intercept of a Very High-Altitude Supersonic Target Missile: **A *Nike Hercules* missile fired by the Army research and development contractor in November 1958 destroyed a supersonic target missile traveling faster than 1,500 miles an hour at an altitude greater than 60,000 feet.**



March 1959, Free World Solar Satellite Launched: **At 10 minutes after midnight on 3 March 1959 an Army *Juno IV* four-stage rocket launched the free world's first successful lunar probe *(Pioneer IV)*. The space capsule (fourth stage) passed the moon at 1600 on 4 March and went into solar orbit on 5 March with an estimated period of 392 earth days.**

MILITARY DIGESTS

Geopolitics and Geostrategy

Translated and digested by the MILITARY REVIEW from a copyrighted article by Rear Admiral Lepotier in "Revue de Défense Nationale" (France) February 1958.

IN THOSE gloomy days of June 1940, a poster appeared in many French cities—a poster that was undoubtedly a product of official psychological action. It represented a world map with Germany in black, the territories of the French Union and the British Commonwealth in red, and bore the legend: "We will gain the victory because we are the strongest."

Later, through the course of events this geopsychological slogan assumed a character of stinging irony.

At the same time, from across the channel, another French voice launched an appeal that made history, a passage of which prophesied:

There are immense forces existing in this world . . . that have not yet entered into action . . . one day, these forces will gather and win through. . . .

This came true four years later.

This practical case illustrates the danger of an oversimplification of geopolitics and geostrategy in an age when world problems, and, in particular, those of politics and strategy assume an ever-growing complexity.

The general geography of our universe has always constituted an essential fundamental factor in politics and strategy. However, in the past, in spite of the well-known relations between the diplomat and the military, the two have looked at maps from widely diverse points of view.

The Diplomat

The diplomat was, above all, interested in the territorial organizations and their boundaries for which man uses lines based either on geographical configurations, such as coastlines, rivers, and mountain ridges, or on artificial lines like meridians or parallels.

In this respect the first and most global geopolitical demarcation was the one decided by Pope Alexander VI in his "Bull of Demarcation" in 1493, splitting the unexplored areas of the entire earth between the Spanish and the Portuguese by a meridian 925 miles west of the Azores or, actually at about longitude 47°W. This decision became the cause of a good many wars, not only between the beneficiaries and the seapowers (England, France, and later Holland), but also between the beneficiaries themselves.

The expansion of littoral colonies toward the interior of continents was often bound by meridians or parallels. For example, in North America the United States-Canadian border, between the Great Lakes and the Pacific coast, coincides with the 49°N parallel, while the 141°W meridian forms the boundary between Canada and

Alaska, fixed by an Anglo-Russian agreement in 1825.

In 1902 the Canadian Senator Poirier, in order to promote the development of the polar regions, propagated the idea of the polar sectors encompassing the area between the two extreme meridians of each riparian country. This theory was applied by the USSR in her decree of 15 April 1926, declaring all islands in the Arctic between the 32°E and 169°W meridians as being Russian territory.

In more recent times, this delimitation trend in geopolitics resulted in the famous iron curtains across Europe, across Korea along the 38°N parallel, and Indochina along the 17°N parallel, besides the disputed Israeli-Arabic armistice line of 1948.

The Strategist

The strategist, in turn, looked for a long time at geography only as it affected his capability of moving armies. He tried to use the given geographic conditions advantageously in his maneuvers, because—according to the classic definition—strategy tries to bring the forces into contact with the enemy under the most favorable conditions.

Thus for a long time politics and strategy almost exclusively were interested in the physical geography of our universe: distribution of land and water, relative size and position of the different countries, hydrography, topography, and climates. However, the considerable development of means created to multiply man's activities makes it urgent today to consider other geographic factors which are much more difficult to analyze and usually less constant. These affect political and strategic problems alike which thereby are brought into a closer interrelation than in the past.

Physical geography provides the basic structure of the whole, but, within this framework, we henceforth will have to follow the evolution of the factors of human activity: resources of food, deposits of raw materials, power supply, industrial development, areas of production and consumption, means of transportation and telecommunication, and the actual military potentials.

The geopsychological map was false, for it used the surface areas controlled by the two adversaries as the only means of comparison. The Sahara Desert, for instance, covered a much bigger area than Germany, yet its military potential was nil. What counted was only the military potentials that were immediately usable on the front.

Furthermore, from the psychological point of view, such a simplified interpretation was completely delusionary, since it affirmed that the overwhelming difference in the actual surface area guaranteed the victory. More recent history shows that similar mistakes have been made judging the respective power of Israel and the Arab States by a comparison of the respective territorial areas.

Human Geography

Possibly the most important factor in geopolitics and geostrategy is the evolution of human societies. The latest statistical records reveal the extent of the demographic pressure in the world. While the total world population is estimated to have been less than 500 million in 1650, today it amounts to two billion, 800 million people—growing at a yearly rate of about 40 million.

With the land area constant, and with the portion of tillable soil difficult to expand, such an increase in consumers has even greater political and strategical consequences since the overpopulation is distributed unevenly.

We experienced this drastically in Algeria; but the situation in India, China, and Japan, for example, is even more alarming. The projects for "transforming nature" in order to increase the areas for cultivation or industrial uses apparently

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cannot solve the problems at a satisfactory rate.

Birth control becomes imperative, but it will be as difficult to materialize as disarmament because demographic vitality is justly considered as an element of the military and economic potential. For this reason, demographic vitality is promoted by our social laws, and encouraged in the USSR by Mr. Khrushchev. Yet overpopulation also can become an argument in support of claims for "living space" for nations, as was the case not too long ago.

Numerical statistics of the populations of the different countries are not sufficient to characterize their human potentials. We also must know their internal structure; distribution by age, sex, profession, and population centers; their scientific and technical potential; their capacity to create and to construct modern materials; their work efficiency; the psychological reaction of the masses toward social problems and political doctrines; their permeability to psychological actions; their resistance toward the hardships of war; and their military bravery.

Migration

Another factor to be considered in the geopolitical situation is the expansion process of mankind across the continents, originating in the old Eurasiatic world, the "world island" or "heartland" of the geopoliticians Mackinder and Haushofer.

From the central part of Asia, the migrations headed toward the fertile, temperate peninsulas in the west, south, and southeast, especially toward Europe and monsoon Asia.

The new environment, with its easy life on the shores of the Mediterranean Sea, relieved the nomad, to a certain degree, from his daily struggle for elementary subsistence. It permitted the more gifted to devote time to the study of nature, techniques, and art; to improve the means of navigations—from this came the exchange of goods and ideas. By the 16th century the European civilization was developed to where they could venture to go on the open sea, discovering the other islands of the world archipelago. Simultaneously, the east Europeans set out along and across the big Siberian rivers to conquer the northeastern part of the original island.

These two movements originated the geopolitical implantation of the two antagonistic blocs of today. The conquerors of the east preserved their grip on Eurasia; the conquerors of the west swarmed out over the other continents, especially over the Americas, while still keeping the western part of the European peninsula.

Turning their backs on one another, the conquerors of the east and the west inevitably came face to face at the antipodes, that is, in the northern Pacific where Asia's northeast adjoins America's northwest.

This meeting did not take place until the beginning of the last century, and it seems that its far-reaching geopolitical meaning was not realized at that time. Today, the world statistics of overpopulation teach us that this event marked the end of possible expansions into new lands thinly populated by men of less advanced civilizations. Consequently, the formation of a *second front* occurred, antipodal to the one in Europe, between the two human communities of comparable technical level.

The air age allows the conquerors of the two leading continents (America and Eurasia) to reach northward and form an aerial *third front* between them across the Arctic. This is the most striking example of geopolitical and geostrategic importance being conferred upon a previously unknown part of the world by the usage of a new technical device—the airplane. Similarly, the seagoing vessel of the 16th century opened the way to the Seven Seas and the lands overseas.

Significance of Factors

The growth of the populations and the production of technical means that were

created to develop their activities and living standards make a more and more expanded industrialization, requiring raw materials in enormous quantities and varieties imperative.

Today, the search for minerals is carried out in regions more and more distant from the centers of consumption because the nearer deposits have been depleted or cannot be exploited economically. These raw materials can be hauled over the long distances only by sea. In 1940 the Germans shipped Swedish iron ore from Narvik, Norway, to Germany; the United States, today, depends upon foreign iron ores, imported by sea, which amount to 50 percent of her consumption. Her "iron routes" from Labrador and the Orinoco are as vital for her as the route of Swedish iron for Germany, or the African iron routes for Great Britain or Italy. As for France, it is copper, nickel, chromium, manganese, zinc, and lead that have to be imported from overseas.

France also is far from self-sufficient in terms of food supply. Even aside from foodstuffs such as peanut oil, rice, tea, coffee, bananas, and citrus fruit that have to be imported, French agriculture has to import one million metric tons of North African phosphates per year for fertilizer. It consumes millions of tons of fuel for plowing and harvesting, processing of its products, and distribution of these products.

The Suez crisis demonstrated even to the most unconcerned, how much Europe depends on that seaway for oil supply, although it is rather a "shortcut" to the Persian Gulf—the route around Africa and the one from the Gulf of Mexico were still open. It is quite obvious that cutting these sea routes would bring forth a total suffocation of European economy and an absolute paralysis of strategy by the immobilization of all vehicles.

There was no question about substituting the "sea lift" by an "airlift" between the Middle East and Europe to haul *crude oil* because an airplane, for about every 1,250 miles, uses a quantity of *gasoline* equal to its useful load.

Natural raw rubber is imported exclusively from Indochina, Malaya, and Indonesia. In spite of her establishments producing synthetic rubber, Germany fought desperate battles on the sea, up to 1944, to keep open the shipping route for natural rubber from Djakarta to Bordeaux.

"Fossil" fuels like coal, petroleum, and uranium are searched for in areas far away from where they are consumed, implying transport over long distances, hence the geopolitical and geostrategic value of the zones of extraction and transport of these commodities. The example of the Mideastern oil, refineries, pipelines, and of the Suez Canal should emphasize to everyone the significance of the new situation.

Facing enormous geopolitical obligations on one hand and the inevitable exhaustion of the fossil fuel resources on the other, nations strive to develop all the possibilities of inexhaustible waterpower. But these establishments, being generally large and vulnerable, represent sensitive points in the national potential; of course, they too have to be taken into geopolitical and geostrategic consideration.

In essence, in order to evaluate the important elements of the economical potential of a country, we will have to know:

1. Her exploited mineral resources, domestic and abroad: iron and other metal, ores, coal, and petroleum.

2. Foodstuffs, domestic production and imports including wheat and other grains, and livestock.

3. Industrial production of steel and other metals, cars, trucks, tractors, airplanes, wagons, radio stations, radar equipment, and motors.

4. Energy production: thermic, hydroelectrical, and atomic energy.

5. Railroads, highways, ports, mercan-

tile ships and river boats, and tonnages of cargo transported annually.

6. Contributions to scientific research.

In addition, for each element we have to specify the actual output of the establishments, the possibilities of development, and the dependence of these establishments on foreign resources in terms of raw materials, capital, technicians, machines, and fuels. We also will have to consider the possibilities of switching the economy to full war production and the time required.

For instance, the oil potential of the Arabic States in the Middle East cannot be exploited by their own means and cannot be attributed as power factors proper to these states.

The mobilization of the enormous potentials of the United States in the Second World War took four years. Germany started mobilization in 1934. France's mobilization, started in 1940, never really got underway.

Evolution

The evolution of the factors of human and economic geography bears considerable influences on politics and strategy; increasing the interdependence between the two.

One of the consequences of this evolution is an increasing overlapping of the two domains. This has been accented by the cold war and internal subversive wars like Indochina and Algeria, with their emphasis on psychological actions which are both political and strategic.

The psychological action, which in the past was normally exerted on different objects at different times by the diplomat and by the military, will henceforth conjointly and simultaneously be exerted on all. This includes the openly hostile communities, the neutrals, and our own fellow citizens to keep up their will to fight until the political and strategic objectives are attained.

This continuous psychological struggle —at the same time universal and internal, affecting friends, foes, and neutrals—is the most profound consequence of the universal geopolitical evolution.

Expansion

A second consequence of this evolution is the expansion of the domain simultaneously affected by political and strategic problems.

In the past, conflicts remained geographically restricted and there was, generally speaking, a clear distinction between internal revolutions and "foreign wars." Today the slightest trouble tends to grow from the most local level to universal size. On the political level, it may grow from the electioneering platform somewhere in a county seat to the glass palace of the UN. On the strategic level, it may grow from individual sabotage or a single attempt on a person's life to the launching of superbombers and atomic intercontinental missiles.

This continuous flexibility of changes in scale and level is something the politicians and military have to get used to, for it bears considerable influence on the conceptions of both. In politics the entire gamut of political actions, from an electoral or parliamentary argument to international parleys on highest diplomatic level, are closely interrelated. In strategy the most modern concepts of intercontinental thermonuclear warfare also will have to consider battles in the mountains, rice paddies, and streets, and arguments in offices and cafes. *A bazooka, a grenade, or a terrorist's bullet instantly can wipe out the strategist who is studying the trajectory of his intercontinental rocket across the globe.*

This situation requires continuous flexibility in alertness and conception, on the political as well as on the strategic level.

Preparation for War

From this point of view, the formula of how "to prepare for a war" unceasingly

has aroused the most vivid contradictions. We have to wage wars which were the most diverse in themselves, and most different from the central European engagements of the last two World Wars.

One must prepare for a war when one is decided to wage it at the time and place chosen by *oneself*. If we prepare for a war solely because we credit an adversary with the *intention* to wage it against us, loudly promising not to make the first move under any circumstances, we doom ourselves to defeat for the following reasons:

1. It is dangerous to base the fundamentals of one's own politics and strategy on the adversary's obvious intentions—that means to prompt him to fool you, an amusement he won't miss.

2. One will never be able to get a moral unity about these intentions, either on the national level or among the allies, because the adversary will alternate threats and smiles. Consequently, there will not be any strategical unity, national or interallied, about the way these "intentions" will materialize strategically.

3. Everyone—inside the country as well as among allies—tends to *minimize* the "intentions" of the adversary, the means he might put into action, and the probability of his taking the initiative in order to cut down on the effort which is required for one's own preparations.

4. Preparatory measures always and automatically will lag behind the initiative that they pretend to counter.

5. Since these preventive measures have the function of a deterrent, it is quite evident that the adversary—to whom, by definition, we have given the initiative—will take the initiative somewhere else and in another form than expected.

Intervention Forces

In a politico-strategic situation that is defensive in principle—a situation which becomes less and less enviable because of the decisive military, economical, psychological, and political effects of the first blows—there is only one thing which can be done. This is preparation for *the most unlikely* contingencies, for these are precisely what the adversary will try to do. On the strategic level, this leads us to foresee the use of "intervention forces," different in means but all having in common a maximum of rapidity of action at any place combined with a maximum of percussive force and strategical and logistical autonomy.

This implies, of course, the possession of *the entire gamut* of means of modern warfare, and, above all, the possession of the most powerful means. Suez brought painful realization of how great "classical" military powers, facing the pressure of modern atomic powers, can get in a same situation where the tribes of their overseas possessions were in the past when they had to face the "classical" military powers.

The weight of the United States in the affairs of this world, besides her richness and dynamic potential, stems from the high degree of readiness for global interventions she has developed for her Armed Forces. Up to the last World War, with three oceans protecting her, she did not develop any overseas intervention forces until the need arose. When transcontinental thermonuclear arms appeared on the strategic scene, she immediately set up and has maintained in ready alert a force armed with thermonuclear weapons for instant intervention anywhere in the world. This is in addition to the intervention forces that are semiatomic or nonatomic, outfitted with the entire gamut of weapons, for battle anywhere on the planet.

Constant Factors

From the sensational progress in intervention capabilities, in destructive power, and in overcoming the limitations imposed by the terrain through the use of certain new arms, some have concluded that the physical geography of our globe is tend-

ing to lose its "classical" influence on strategy.

For instance, a foreign auditor at the NATO College stated that the traditional importance of the Russian space is henceforth minimized due to the use of long-range superbombers and superengines.

Likewise, the traditional "locks" of Suez and Gibraltar have ceased to be of decisive significance for the control of the Mediterranean in this air age.

But the constant factors of geostrategy on the world theater of operations still hold a determinative importance; but what is evolving—as a function of the performances of the new means at our disposal—is the *way* in which we are making use of them. In this field one should not "make preparations for the last of wars."

The art of the politician or strategist essentially consists in exactly judging *the possibilities of the moment*, taking into account the different factors and the means at hand.

Geography remains the substructure of all activities, all the more since they draw more and more on the rarest and most sparse resources of the earth. In this respect, aviation—considered to be "strategic"—of all arms, is the most dependent on geographic resources. In the widest sense it depends on:

1. Deposits of rare metals that are used in special alloys for fuselage, equipment, and engines.

2. Location of construction plants in terms of sources of energy, transportation facilities, and quality of its scientific and technical personnel.

3. Location of operational bases, assembly plants, and maintenance shops.

4. Supply of the enormous quantities of high-quality fuel, the long-distance transport of which has to be performed by tankers of large capacity and relatively low motor fuel consumption.

The ground forces, too, have to pay attention to geographical factors. These factors create the conditions in which an armament is to be realized, in which the means of ground, air, and sea transportation move in increasing numbers, and in which their supplies of food, fuel, and ammunition are conveyed.

The air-naval forces are subject to the same limitations as far as construction, maintenance and repair, and supply are concerned, although the forces in operation have the possibility of using floating maintenance shops and fuel and supply depots. But the layout of seas and coasts, their depths, climatic patterns, and meteorologic conditions always are essential factors in the possibilities of actions in the air, and on or below the surface of the sea.

Actual Situation

The evolution in the world during the last decades seems to confirm the pre-World War I geopolitical theories of Mackinder. Actually, the major part of the Eurasiatic Continent (Mackinder's "world island" or "heartland") is occupied by the USSR and her satellites, representing the largest geopolitical entity occupied by a single power, extending more than 180° longitude, and from the 35° parallel to the North Pole.

Its essentially continental character is underscored by the fact that its longest coastline borders the Arctic Ocean where navigation is limited. The other border seas are geostrategically closed by other powers—the Baltic Sea, the Black Sea, the Sea of Japan, and the Sea of Okhotsk. For this reason Russia's traditional push toward the open seas remains a permanent fundamental factor of her geopolitics which has scored two major successes since 1945. These are:

The occupation of the Kuril Islands, breaking the insular blockade of the Sea of Okhotsk.

The victory of the Communist armies in China opening a waterfront of more than 1,800 miles on the Chinese seas. This is of

limited usefulness, however, because the insular blockade remains tight from Japan down to the Philippines, with passages at Okinawa and Taiwan; hence the push of the Communists toward South Korea, Indochina, and Singapore.

In the West the annexation of the port of Pechenga, former outlet of Finland to the open Barents Sea; the "iron curtain" in Germany; the reluctance of the Russians when they had to evacuate the Danish island of Bornholm fit into the same pattern. In the Mediterranean, we see the development of the Albanian harbor of Vlona, and of the "Adriatic Gibraltar" of Saseno; the Communist rebellion in Greece; and Communist penetration in the Middle East and French North Africa.

Zones of Friction

The geopolitical and geostrategic zones of friction between the continental Eurasiatic bloc and the complex maritime bloc spread over the rest of the world, are, by virtue of this configuration, chiefly located along the periphery of Eurasia.

The back areas of the bridgeheads that are kept by the Western World on the margins of the Eurasiatic Continent are necessarily overseas, and their vital communications go by sea or air.

In the Arctic region where the USSR seaboard faces American shorelines, the contact between the leading powers of the two blocs is direct and almost exclusively by air, due to a permanent ice barrier.

The Atlantic Region encompasses the "bridgeheads" of Europe and Asia Minor, and their back areas in America and Africa.

The region of the Indian Ocean, a vital zone of Western interoceanic communications, is separated from the continental bloc in the north only by a fragile border of states, phychologically pressed by the USSR.

In the region of the northern Pacific, there is the "second front" between the two blocs—the "iron curtain" of the Bering Strait, antipodal to the front in Europe.

In the Far East geography helped the leading Western Power in her policy of "*containment*" by putting up an island barrier off the Asiatic Continent that fell into the adversary's hands with the exception of the critical "peninsular bridgeheads" of Korea, Indochina, and Singapore.

This strategic insular cordon is held by the maritime power (the West) with the exception of the Kuril Islands which the Soviets received as the price for the last-minute intervention in the war against Japan. The Soviet bloc also was awarded the Thuringian salient in central Europe, a mere 93 miles from the Rhine River.

Communication between the different insular outposts in the oceans around the Eurasiatic Continent, as well as with their overseas hinterlands, can best be accomplished by sea. Only seaborne transport allows high commercial and strategic transportation capacities on which chiefly depend the fuel supplies for airplanes and other vehicles.

The "shortcuts" of Suez and Panama are, politically and militarily, sensitive spots, and technically inadequate for big naval transportation and combat units.

Under these circumstances, the Antarctic crossroad is becoming the turntable of all interoceanic communications of the Western Powers. At the same time, the triangle of South America—Africa—Australia will, in the near future, secure the shortest and most remote intercontinental air connections on the southern hemisphere.

The most characteristical evolution of geostrategical factors is represented by the functional change of the polar regions of the earth. The Arctic, yesterday inaccessible, is becoming a front of air contact between the two leading powers. The Antarctic is becoming the decisive rear platform for the Western sea and air communications.

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The Influence of New Armament on Preparations for War

Digested by the MILITARY REVIEW from a copyrighted article by Lieutenant Colonel General Viktor Bubanj in "Vojno Delo" (Yugoslavia) Issue 1-2, 1958. Translation by Mr. LaVergne Dale, Leavenworth, Kansas.

WITH the advent of a veritable arsenal of new weapons (nuclear weapons and ballistic missiles) every country is faced with the possibility of being obliged to participate in a frightfully destructive war, differing considerably from all wars of the past. In spite of the desire of the general national masses for disarmament and lasting peace as a real solution, all countries are thus forced to an intensive scrutiny of strategic and tactical principles, and the structure, organization, and armament of armies.

Countries which possess the new weapons have, by study and experiment, arrived at a reorganization of their armies, transforming them into armies of the so-called "atomic" type. All other countries find themselves faced with the great dilemma of how to make ready for and what procedures to follow in case of such a war. With the extremely rapid development of technique and the fantastic financial burden of equipping and maintaining an army with the new means, this dilemma is of increasing intensity.

How to wage war is not solely a question that concerns the professional military and, when carefully considered, is not even the most important question. If we accept as correct the judgment of qualified specialists and the universal opinion that in an eventual war the new weapons will invite catastrophic results, it can be seen that this is a national question in the broadest sense—a question of "to be or not to be." It is also a national question because the entire nation, with all its forces and means, would be involved in a war of this kind. The distinction between front and rear would disappear. It also would be a national matter, and not a matter concerning the professional military only, because for such a war it is necessary to prepare not only one's military forces, but the entire nation.

The Differing Problem

The problem is different for every country, depending on whether it is a large and industrial power, whether it has the new weapons at its disposal, and to what extent politics and management are joined with the requirements of the broad masses. All this exerts an influence on the final elaboration of a doctrine and on the establishment of the fundamental principles the country and its armed forces will follow in war. For this reason both official and semiofficial doctrines and reorganizations in the armies of individual countries usually represent a true picture of internal conditions and foreign and domestic situations.

The center of gravity for study doubtless must be in the domains of doctrine and strategy. This is because nuclear weapons and other technical achievements in electronics, transportation, aviation, and missiles go far beyond tactical significance. The value of consideration of the influence of these new means on the tactics and the development of operations is not herein minimized. However, none of the changes in tactics (breadth of front or greater depth of disposition, march techniques, and supply methods) will yield full benefit and may even be detrimental, if the strategic side of the entire problem has not been solved beforehand.

The danger exists of making a change in organization or tactical procedure which, in essence, is an attempt to fit a new quality perfectly into an old mold. The justifiableness of this comment may be perceived by particular study of any

of the "new weapons." Generally speaking, they all far exceed any tactical framework.

It is understandable that, in the examination of this problem in any country, the center of gravity primarily is found in the study of the aspect and character of the possible war and the estimate of the worth, under the new conditions, of the tactical and operational procedures of World War II. Clearly, this obligates a parallel study of possible new tactical procedures and concrete variants in an eventual future war. It is also clear that these examinations influence the final conclusions.

Today, it is vitally necessary to determine principles and rules in accordance with basic matters—to determine the places and significance of the individual, and constant factors—and only then, on the basis of these, to approach and work out the remaining problems.

The Proper Perspective

In the case of small countries or, generally speaking, countries which could find themselves in a military clash without the new combat means at their disposal, correct appraisal and "putting everything in its place," acquires an enormous significance. This is also true because of the danger of a loss of perspective and of falling into an idolatrous worship of these means. The idea that "possession of them solves every problem" is very far from the actual truth.

As a result of the invention of new combat means, the man-matériel relationship has become a key question. This always has been difficult in wars, but in our times it also has become a national and most important doctrinal military question. In a narrow military sense, it is regularly treated and solved in various ways. Quite properly, a great deal is written concerning it. Some writers, not finding an answer to the question of how to establish the correct relationship between man and the new techniques, although deeply impressed by these weapons, hide behind the familiar expression that "the man is still the decisive factor."

In truth, men play the principal role in everything. However, there is not much benefit derived from declaring this truism in this manner. It is necessary to find and give a practical answer which would represent the material reflection of this truth in the reality of a country—in its views concerning war, its strategic supplies, its operational and tactical methods, and its army organization.

Technique and Man

The problem itself is complex, but its analysis and the devising of practical solutions is still more complex. The man-matériel relationship is continually differing, whether because of a change of technique or of men. Since both men and technique change, the problem cannot be generalized. Just a glance at reality will show the great complexity of this matter. The relationships to technique of the man who is armed with a pistol, of the man who sits in a tank, or of the man who from a launching site in Africa fires a rocket with an atomic warhead at a target in Europe are very different. The role of men in battle, of men who attack and seize a position, is great. However, the role of men who press a button to fire a rocket (which, by its explosive force, destroys a target) is very small, while the role of technique is great.

The same thing is true if we consider men in combat in war. A man armed with a pistol as opposed to a man armed with an automatic weapon or a man in a tank or a plane, is not in the same situation. Technique and matériel create a difference. For this, and for many other reasons, there is nothing gained in hiding behind the expression that "the man is decisive." This will be of little help to the men fighting a future war if they have not

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found the answer to the question of how to combat the new weapons.

It is not immaterial whether a country possesses modern military means, or whether it finds itself at war with an enemy who has, or does not have, these means at his disposal. Nevertheless, there is a possible solution for a country, even in an unfavorable situation, to be able to carry on fighting successfully. This would be the neutralization of all of the enemy matériel to which this country is not able to oppose its own corresponding matériel (in point of number and quality) by means of an appropriate method of warfare. If the mode of warfare decided on is well-chosen and in harmony with the real situation, *an equilibrium between man and technique in the fighting on both sides cannot but result.* Only in cases where equilibrium has been attained will the man conquer who fights from justified motives, and who has more strength, courage, and resolution for fighting until victory is achieved.

Historical Equilibrium

History has given us many examples of historical balance. A case in point is found in the record of the Yugoslavian National War of Liberation. This considers the skill of Yugoslavian National Liberation Forces in effecting the neutralization, by means of strategic or tactical procedures, of the enemy technique the national forces did not possess. The strategic conceptions of the supreme command thwarted the effective exploitation of the enemy's heavy technical means; the tactics of the National Liberation Forces were in complete harmony with them. For this reason the German heavy artillery and aviation never had paying targets. Never were these weapons, in the hands of the Germans, able to exert any material influence on the outcome of the engagements conducted against the National Liberation Forces. In fact, their heavy weapons were often an encumbrance to their own troops, for they hindered rapid maneuvers, and bound them to communication routes.

The enemy's technical advantages were neutralized by conducting the war in a practicable manner. The Yugoslavian supreme command did not copy anyone else's strategy, organization, or tactical procedures, but devised such strategy and worked out such procedures as were best suited to the conditions of country, people, and aims. The enemy was compelled to fight the battle in space and time and in a manner suited to the National Liberation Army, enabling the liberation forces to take advantage of the great vigor, skill, and superiority of their fighters. Neither the supreme command nor any of the individual commanders committed the error —because of someone else's theory of war, or recognized system of strategy or tactics—of fighting the enemy on "his own ground."

Under the present conditions the correct solution can be found only on this same basis. *Correct strategy in general, and tactics in particular, must be capable of neutralizing that enemy technique which we do not possess.*

Conditions must be created under which the battle will be fought with a close state of balance as regards weapons and matériel. That is to say, the situation must be achieved where the human factor will be the decisive one. This can be attained by means of a definite mode of warfare which will not give the enemy the opportunity, or offer him paying targets, for the employment of atomic or rocket weapons. It will force the enemy either to refrain from battle or accept it in a way which makes it impossible for him to take advantage of technological superiority.

This concept could quite properly be called, *"regular, pre-prepared, partisan warfare."*

Planned Partisan Warfare

The above appelation will likely be criticized, but that is not of material impor-

tance. It is a type of warfare for which a country would be prepared in advance and in which its army, modernly equipped (but with armament adapted to such warfare), would fight jointly with an organized and armed population using preestablished strategy and tactics. This is warfare in which, by means of strategy, integral action would be ensured and, by means of tactics, the exposure of large units to the destructive blows of the enemy's technique would be prevented.

The employment of a doctrine of this kind would not be acceptable for every country, nor would the conduct of such a war be simple. There is no doubt but that it is much easier to wage war having all technical means available.

Basically, a country of a reactionary social order or one which is a member of a military bloc is not able to adopt this doctrine, first, because it is a national doctrine of war which can be put into practice only if the population desires it and, second, because the interests of this country, and its military doctrine are subordinated to the interests of the bloc and not to those of the defense of the particular country and its independence. It can be put into practice only when the country in question is defending itself.

To put this doctrine into practice successfully everything must be adjusted to it: the physiognomy and composition of the army, the individual training of the soldier, military relationships, cadre, armaments, and equipment. The entire country must take part in the preparation for the eventual realization of such a doctrine.

Moral Effect

The problem of the psychological-moral effect of the new means on the combatants is extraordinarily important and requires particular study. Although we usually limit ourselves to the consideration of the exclusively material effects of those means, the fact is that their psychological action is no less important. It could even be said that in a large number of cases this particular action is immeasurably greater than the material effect. This will most often occur in cases where the adversary is unacquainted with the worth of the new weapons, does not possess them himself, and where the population and the army are not prepared for combat against them.

Demoralization

Many examples of demoralization are to be found, not only where such means as atomic weapons or rockets are involved, but also where the ordinary, classical weapons are employed. It is well-known, for example, that peoples who are unacquainted with the capabilities of particular technical means usually ascribe to them a capability which they do not possess. Anyone who has studied or participated in military operations knows of panic which seized good units or fighting men through the action of weapons with which they were not acquainted and were not prepared to combat.

As regards the demoralization of entire populations, history contains a considerable number of good examples. When we speak *of neutralization of the technique which we ourselves do not possess*, in addition to our endeavor to reduce its actual material effects, we also must prevent the possible psychological action of the enemy armament. Accordingly, we shall achieve the successful neutralization of the material effects of a weapon by means of proper strategy and tactics which will make a diminution or a complete neutralization of its action possible. *This can be achieved by means of the consistent policy of not affording the enemy a favorable target for the employment of such means.*

We shall achieve success in the neutralization of the psychological effect of any weapon by means of the psychological preparation and training of the people for warfare and combat against an enemy who possesses these means. This is done by acquainting them with their capabili-

ties and the corresponding measures of protection, and by means of practicing the appropriate procedures. In doing this it is very important that the preparations carried on in peacetime be so conducted that the people will learn the entire truth concerning every one of such means of combat. This will instill faith and confidence in their own commanders.

On the other hand, if the truth is learned from the enemy when he employs these means, it may have withering results on morale. It is necessary to devote a great deal of attention to the psychological factor in operations under present-day conditions, and the schooling and preparation of the people in this regard must not be allowed to lag behind their specifically military training.

Modern Army Concept

A matter which is timely and practical, often written about, and still more discussed in connection with new technique, concerns the "modern army" concept. This concept, almost by definition, is automatically synonymous with an army that has at its disposal all or the greater part of the latest combat means. Today, since these means are the nuclear weapons, guided missiles, and supersonic planes to deliver nuclear bombs, this implies that only armies which possess these weapons are regarded as modern.

Persons with this understanding of the concept of a modern army seek the solution to all problems by looking on military knowledge and skill through the prism of these weapons. How incorrect this is and how dangerous, also, there is no need to state.

The modern army concept cannot indicate solely its technical outfitting but its suitability—that is, whether in point of strength, organization, training, armament, and the strategy and tactics it has adopted, it fills the needs of its country. If it answers to these needs then it is a modern army, but if not, then modern weapons will not save it from defeat.

In the face of this, a definition of the modernness of armies would be: *an army is modern which in its strength, armament, organization, doctrine, and training is qualified for conducting war in a manner wholly expedient for that country alone, and whose every part is adjusted, trained, and equipped for meeting this requirement.*

Differing Armies

It is natural today that armies should differ considerably from one another, and that dissimilar doctrines should exist as a reflection of the nature of each country. But this does not exclude the exploitation of the experiences of others and of all that is good, especially if this coincides with the views adopted by the country concerned. This holds true for theory, combat means, or military technique.

The idea that only modern matériel and weapons make an army modern is dangerous, especially for small countries. The line of argument thereby automatically follows that it is necessary to equip the army with all modern means and that it must be, in miniature, a copy of the army of a great power. This would necessarily invite the acceptance and copying of the other's strategic and tactical methods and principles. As a result, engagements would be fought in a manner corresponding to the possession of still more such means and still more modern technique.

A typical example of such a situation was found in 1941 in the physiognomy, doctrine, and strategy of the former Yugoslav Army. In this army, all aspects of theory (French, German, English, and even Russian) found a place. It possessed no doctrine of its own, for the probable character of a future war in relation to Yugoslavia had not been studied and apprehended. Moreover, in practice, antiquated principles from World War I were employed. Both the army and everything

connected with it developed under the influence of these foreign theories, although no real basis—material or psychological—existed for any of them.

While the German Army very easily crushed that ineffectual force, it quickly found itself faced with an unsolvable problem and lost the battle to the weakly armed units of the National Army of Liberation.

One of the main reasons for this, certainly, was that the war was conducted in the proper manner, that is, in the strategy and tactics used by the National War of Liberation. In this connection, it must be emphasized with reference to the modern army concept that during the course of the National War of Liberation *the Yugoslav forces made use of only such armament as they could employ to their own advantage.* In numerous cases and without regret they refrained from the use of artillery and tanks as soon as the danger existed that they would be forced to accept battle under unfavorable conditions, and lose the initiative or freedom of maneuver on account of them.

As soon as conditions were created that were favorable for the profitable employment of the heavy weapons, they were used. But at no time was the liberation army blinded by mere modernness—at no time was it considered that modern weapons alone would be decisive with regard to the final outcome of the battle or that one could not fight successfully without them.

It is an incontestable fact that weapons and matériel exert an influence on choice of strategy and tactics, but precisely for this reason it is necessary, in an army, to have only those weapons which render possible, *and do not prevent*, the carrying out of those forms of strategy and tactics that are adapted to the given country. The modern army must take this into account.

Conclusion

It is probable that every future war will, for the nations involved and because of the new means, become essentially and immediately "total war" in the absolute sense. In the face of this one cannot look on the problem of the study of the form of the future war—of its strategy and tactics—as a narrow, professionally military problem. There is not a question that can be solved solely from the standpoint of the "professional soldier" and on the basis of the type of the so-called classical army.

Least of all will small countries be able to solve successfully any such question by using the methods and formulas of the great powers (for example, on the basis of the theory of "retaliation," "pushbutton warfare," or aerial superiority). Guided by such norms and manner of thinking—which essentially means, by copying—small countries will be incapable of discerning their own strength and will be led into a blind alley, which will not be the case if they see things as they really are.

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Total War But Vital Point Strategy

Digested by the MILITARY REVIEW from an article by Brigadier General Antonio Saltini in "Rivista Militare" (Italy) June 1958. Translation by Mr. LaVergne Dale, Leavenworth, Kansas.

THE expression "total war" is now so commonly employed that even one unversed in matters of a military nature is aware that a total character is unavoidable in any modern war of worldwide dimensions. However, the scope of this expression is not well-defined.

In the main, common opinion identifies total war with a conflict in which there is no discrimination in objectives. At the same time, no rational action can dispense with discriminatory evaluations. It is, therefore, necessary to arrive more precisely at the sense and degree to which the total character of war ought to be understood.

Total war cannot be called a new phenomenon. Many of the wars of antiquity, particularly those associated with major migrations of peoples, were of a total character. This was manifested either in their intent of annihilation of the enemy population, or in their conduct by participation of the entire friendly population in the fighting and physical elimination or reduction to slavery of the conquered population.

With the advance of civilization, the stabilization of the centers of population, and the development of industry and commerce the complete annihilation of the vanquished people worked harmfully, even for the victor, and total wars became rare.

In the Middle Ages and in the modern era the peculiar political and social organization of each of the two periods brought about, first, the knightly concept of war, and then, professional armies reinforcing the tendency to confine conflicts solely to combatant forces with a minimum of involvement of populations. In "conventional war," resolution of the belligerent situation is even sought exclusively by threat and maneuver without an actual clash between armed forces.

The forerunners of a reversion to totalitarian forms appeared during the wars of the French Revolution and those of the Empire when the repercussions of the armed conflicts on the life of the population spread and intensified. As a result of this, war ceased to be a private affair and became a national phenomenon. It was a political and social, rather than military, transformation. Salient manifestations of this return, in addition to resumption of the armed clash, were mass levy and the so-called feeder wars.

In spite of the increased participation of populations in war, conflicts up to and throughout all of the 19th century were far from being what could be defined as total. Many elements remained absent from the conflict due to the physical impossibility of participating in it, and vast expanses of the territories of belligerent nations were able to escape attack completely. The outcome of war was still solely decided by the clash of armed forces.

In the first half of the present century —with the two great World Wars—factors which were particularly suited for impressing totalitarian aspects on war gradually appeared. The chief factors—the last of which constitutes both the cause and effect of total war—were the advent of aerial means, the widespread introduction into war of machines in general, and the ideological character assumed by conflicts.

Aerial Means

Aerial means, as the carrier of weapons, combined mobility with power and freedom of action, and opened up to the

offense the entire territories of the belligerents. Moreover, with its capability of observation, the aerial means greatly facilitated the search for and selection of objectives. Finally, by shortening distances and diminishing spaces, they accentuated the political, economic, and military interdependence between nations. It made possible and, at the same time, obligatory, great coalitions broadening the sphere of conflicts and making for their total character.

The aerial means presented itself, therefore, as that factor par excellence which rendered total war possible. For this same reason, airpower progressively grew in importance, ultimately presenting aspects of preeminence in comparison with ground and naval forces.

Military Power

The growing employment of machines in war, in large measure rendered combat potential conditional on the availability of raw materials, on the inventive, organizational, and productional capacities of belligerent peoples, and on their technical and industrial setup. Thus operations are bound to a system of production and distribution which is wholly exposed to air attack. Energies, activities, and materials which in the past had remained absent from war or whose incidence on it was of a long-term nature only, assumed decisive values. There arose the concept of war potential—which is closely bound to that of total war.

It was possible to crush the enemy much sooner by paralyzing his armed forces indirectly, that is, by means of blows dealt on the enemy's war potential in its origins and functions before meeting with it on the field of battle. Thus armed forces no longer constituted the sole element of military power and, at times, not even the principal one. Numerous other elements presented themselves, often more vulnerable to air attacks than the armed forces.

The characteristics of war were modified; strategy greatly expanded its sphere of competence and began to assume ascendancy over tactics, in some cases, even determining the decision alone. The participation of populations in war increased, moreover, and the battle no longer was solely an encounter between armed forces but rather a confrontation of nations.

Thus both premises, mutually interdependent, of total war could be realized: the involvement in war of all friendly energies and resources, and the tendency toward the destruction of all the elements of all enemy war potential, in whatever place and under whatever form they presented themselves.

Ideological Character

On this favorable basis for the conduct of total war was finally superimposed the ideological character that had meanwhile been assumed by conflicts. Whetting hatreds, the ideologies added new impetus toward the total destruction of the enemy and, at the same time, an appearance of ethical justification. Exalting minds, they favored the development of guerrilla activity and permitted the impressing of a unified and vigorous character on psychological war, the strengthening of the friendly moral forces, and the eroding of those of the enemy.

The three previously mentioned factors —that is, the advent of aerial means, the widespread inclusion of machines in war, and the ideological character assumed by conflicts—interact reciprocally with one another. Thus while on one hand the gamut of the possible objectives was becoming richer and more extended, on the other hand, the means for fully investigating and striking them was becoming stronger, and the moral forces inciting to total destruction were becoming more robust.

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New Weapons

At this point new and powerful means of warfare appeared, among them, nuclear weapons and missiles. These, producing an extraordinary increment of destructive power, have increased, by like amount, the possibilities of total war. Along with this the baneful consequences of total war have increased to the point where some recognize in it a veritable form of suicide for the participants. The eventuality of a conflict in which, even if victorious, the resulting harm and injuries would be greater than the advantages deriving from it has turned attention to total war.

In contrast with those of antiquity, a modern war cannot have as its aim the annihilation of the enemy people. This is true not only for ethical but also for economic reasons. The two World Wars were total only from certain points of view, for both of them lacked the feature of annihilation of the enemy. The economies of the individual nations are too interdependent today not to feel repercussions from the destruction of the others. Paralysis of and also serious damage to the economic and productional system of the vanquished people would create formidable problems for the victor in the postwar period. In a war between two vast coalitions, total annihilation of the conquered coalition would mean death and wilderness over nearly half the globe with incalculable repercussions over the remaining half with even this portion certainly not immune to serious attacks.

A modern war can have only the aim of breaking the will of the adverse populations to resist, preserving for them, however, the possibilities of survival. It follows from this that there is perhaps no discrimination between strictly military and nonmilitary objectives.

However, *rigorous discrimination is indispensable.*

This is imposed by the principle of economy which is always imperious in war. Even though ample nuclear means are available and without considering their cost and the restrictive factors of production and employment, the total destructive power utilizable by one of the two parties will always be limited if the number and dispersion of the elements constituting the war potential of the adverse party are considered.

Vital Points

In any event, it would be absurd to attempt to pursue the enemy war potential through each of its capillary elements when it is possible, instead, to attack it in its vital points which are unavoidably formed along the chain of production, classification, distribution, and employment. It would be just as absurd to attempt to paralyze the enemy's traffic by destroying his communication routes throughout the entire length and breadth of their development, rather than by blowing up their vital constructional elements such as bridges and tunnels. As far back as 1940, Winston Churchill observed that in war the best results are obtained by acting against a small number of objectives of great importance. And Stalin expressed a similar thought when he asserted that in war it is necessary to disentangle from the mass of tasks the one which represents the essential kernel.

It may be observed that the principal vital point of war potential is, properly speaking, constituted by the deployment on the field of operations. Nothing better than this expresses the synthesis of the potential itself. But if this was true in the wars of the past, it is no longer so in modern war, due to the rarefication of the tactical and logistical dispositions and the existence, outside of the field of battle, of objectives that are decisive, vulnerable, and without any capacity of their own for reaction. Obviously, objectives of this type merit preference, especially

those whose destruction has direct repercussions on the effectiveness of the armed forces.

In a war of nuclear weapons it can also happen—and it is even probable that it would happen—that the armed forces would avoid the formation of an active field of operations during the first phase of the conflict, expressly for avoiding exposure to a serious risk of destruction. It would not be so easy, however, to avoid attack on many of the fixed objectives which constitute the war potential in the interior of the territory.

An exigency still more imperious than that of economy requires, at least in the initial phase of the hostilities, a careful selection of the objectives that are to be attacked: that of surviving the possibilities of an immediate counterattack by the enemy. This exigency necessitates, first of all, the removal of the enemy's talons, beginning with the most dangerous and putting off to a second phase the attacks suited for breaking the residual will to resist. Not being able to attack everything, it is necessary to turn one's efforts toward those objectives whose elimination has an immediate repercussion on the enemy's destructive possibilities. These first priority objectives are, as a rule, outside of the ground theater of operations, but all of them are of a definite military character without which there could be no immediacy of effects.

Discrimination

Ethical economic and strategic considerations concur in imposing an accurate selection of objectives so that, contrary to general opinion, modern war fought with nuclear weapons must be the opposite of a war of indiscriminate objectives.

And if it is true that in the danger of indiscrimination may dwell an efficacious inhibitive power as regards the occurrence of hostilities, it is equally true that there must be no confusion between the ways of attempting to avoid war and those of effectively conducting it once it has been unleashed.

The accurate selection of the vital points which are to be attacked and the most suitable order in which to attack them constitutes, therefore, an act of fundamental importance in present-day war. This selection must be a basic part of a modern plan of war and on its correctness largely depend not only the duration but the very results of the conflict. This is, however, anything but an easy task and requires constant activity devoted to search, evaluation, and rechecking for keeping information up to date.

For the sake of caution and flexibility, the plan of the vital points to be attacked must be extended beyond those regarded as strictly indispensable. This obviates the results of errors of evaluation and avoids surprises. Moreover, a preparation for war which was too obviously oriented in the direction of exclusively attacking certain vital points, would be too revealing of particular intentions. However, a moderate overstepping of the bounds of the strictly indispensable vital points would not necessarily signify the intention to attack everything.

Generally, the aim should be toward attacking the vital points on the basis of homogeneousness of class, including in the same class those identified with the same aspect of the enemy's war potential. For example, nuclear power finds its principal vital points in stocks of nuclear devices; airbases; atomic missile launching bases; airplane carriers; establishments for the manufacture of nuclear devices; airplane factories; oil reserves; and oilfields.

Of the above-named vital points—a good share of which are outside the field of operations—the first four have to do with the enemy's immediate possibility of counterattack and are of concern from the point of view of survival. For this

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reason these must be top priority objectives.

Ground power, beyond the field of battle, can be effectively attacked in weapons factories; bridges and tunnels of communication routes; transportation means; reserves; and oilfields.

Industrial power is particularly vulnerable in some of its sources of energy, in its labor establishments, in the structural elements (bridges, tunnels) of its communication routes, and in its power-line networks.

From these examples it follows that there is not always a clear separation between the one class and the other, as some vital points concern a number of aspects of war potential. To these must be given preference, within the bounds of each of the classes to be attacked, yet subordinately to the criterion suggested by the requirement of survival. The choice of the vital points to be attacked must not be influenced by particular aims the war may possibly pursue, because these aims will be much better achieved by means of a rapid and decisive victory than by means of action which do not fit perfectly into the general aim of the war.

In attacking the objectives situated outside the field of operations, it often will be impossible to avoid the involvement, in the attack, of portions of the population, especially if a guided missile is employed as the delivery means. However, except in case of a retort, centers of population must not be considered in themselves as vital points of moral potential, not only for ethical reasons, but also because the efficacy of terroristic war in the interest of victory is quite dubious since this form of war is capable of operating in a counterproductive manner.

Conclusion

The expression "total war," whose meaning is rather vague and commonly understood in the sense of war without discrimination of objectives, indicates a conflict in which one must also conduct attacks outside the strictly operational field. These objectives must be selected carefully. Thus the more the gamut of the objectives is broadened and enriched and the more the available destructive power increases, the more necessary a rigid discrimination becomes to make the objectives which are to be attacked coincide to the greatest degree possible with the vital points of the enemy's war potential. It follows from this that total war is held in check today by the very fact of its great possibilities of destruction. Leaving the confines of the field of operations it must localize itself in the enemy's vital points.

Total war is total in the sense that all the physical and spiritual energies and all the material and economic resources of the belligerents must concur in it and that all of them are subject to attack. It is also total in the sense that national defense demands perfect fusion between armed forces and country. But it is not total in the sense that everything is to be attacked.

Strategy, similarly, is total in the sense that in its shaping must preside the evaluation of all the factors of the enemy's war potential and not solely that of those which are strictly military. But strategy also must be confined in its conduct to the accurately selected vital points of this potential.

In sum: *total war, but vital point strategy.*

Moreover, what is strategy if not the art of selecting and attacking the vital points of the enemy's strength in such a way as to force him to surrender with the minimum expenditure of one's own forces? In fact, only vital point strategy, fully harmonizing with the principle of the economy of forces, can be said to be true strategy.

In the past the vital point of war po-

tential could be regarded as a single thing, since it was constituted exclusively by the armed forces—even though more or less pronounced forms of indirect strategy have always existed. The strategic problem was, at that time, well-defined. Today, this problem has become broad and complex, although still capable of being expressed in a very definite and fairly simple question, namely: *how, where, and when to deal a blow on the enemy's war potential?* In a general sense and on the basis of what has been said, the question must be given the following reply: *with the means and in the manner which from time to time are most suitable, at the vital points of the enemy's war potential. giving priority to those affecting its immediate possibilities of destruction.*

Philosophy of Coalitions

Translated and digested by the MILITARY REVIEW from a copyrighted article by General L. M. Chassin in "Revue de Défense Nationale" (France) December 1958.

MARSHAL Foch once commented, "I admire the Emperor much less since I have found out what a coalition is."

It is difficult not to agree with him.

The defects of coalitions, especially in peacetime, are so very apparent and the results they achieve so often deceiving, that it seems quite reasonable to question their real value.

Coalitions have triumphed, it must be admitted; for example, in the two World Wars of this century. But the fact that some have triumphed does not alone excuse their inadequacies and errors. Additionally, although many have been victorious, many others have been defeated when confronted with the determination of isolated peoples or the valor of a brilliant leader.

Historical Review

In the dawn of modern history, Caesar triumphed over the coalition of Gallic tribes. But several centuries later the alliance of the Franks, Romans, Visigoths, and Burgundians put Attila to rout on the Catalonian fields.

In the Middle Ages the Crusades—at least the first—were true coalitions under the emblem of the Christian faith. As soon as the latter grew weaker and material considerations became stronger, the Crusades were doomed to certain failure.

In the 16th century, in order to defeat Charles V, Francis I did not hesitate to ally himself with the Turk Suleiman and to welcome in the harbor of Toulon the fleet of the pirate Barbarossa. This presents an interesting viewpoint. By entering into a pact with a Mohammedan prince from Asia in order to fight against a Christian king of Europe, did not Francis I commit treason against the civilization which he represented? In seeing only his particular and immediate interest, did he fail to understand the seriousness of the danger of his action to the whole picture, of which—whether he liked it or not—he was a part? At any rate, all of Western Europe including France soon thereafter came very close to being engulfed by the Turkish onslaught. *Can an alliance that is solely based on interest, therefore, be beneficial? History clearly answers: No.*

Whatever immediate good this may have accomplished, it always ended by engendering catastrophy.

An ethically bad decision—even if it appears to be "practically good"—is always to be rejected. Thus metaphysics reenters politics which it dominates. By entering upon an alliance with the USSR, in the middle of 1941, the Anglo-Saxons

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committed a sin against Christian civilization. Could they not have let Stalin fight against Hitler on his side, without binding themselves to him in any way?

It is possible, of course, that the war might have lasted longer without the tidal wave of planes, jeeps, arms, and munitions and supplies of all kinds which flowed into the USSR. This is in no way certain and it is futile to write history as it "might have been." But considering the miserable end of an alliance that has thrown the center of Europe back to barbaric times, it is necessary to reintroduce into our foreign relationships a sense of obligation to the ideal that animates and arms that civilization to which we belong. *"Realism" does not pay. Loyalty does.* These facts represent the guiding light that makes possible a clear judgment of events which otherwise appear difficult to explain.

In its course, history will continue to record both victorious and defeated coalitions. During the periods of stability of a civilization an equilibrium is established between the various states that comprise a "commonwealth." But soon, an ambitious prince feels a dangerous "desire for power" and becomes the "perturber" of whom Admiral Castex speaks so well in his *Theories on Strategy.*

After Charles V, who was finally defeated, the France of Louis XIII and XIV aspired to supremacy. Immediately, coalitions formed against her. After 40 years of almost uninterrupted strife against England, Holland, Spain, Savoy, Sweden, and the German princes, of glorious victories and cruel defeats, Louis XIV finished in a "draw" with his enemies, retaining the greater part of his conquests and leaving his adversaries as exhausted as himself—if not more so.

In the 18th century, Maria Theresa succeeded in dislocating the coalition that had formed against her in the Austrian War of Succession.

An even better example occurred during the Seven Years' War. Frederick II, fighting against the combined forces of France, Austria, Sweden, Russia, the Bourbons, and the German princes, succeeded by genius, tenacity, and luck in triumphing over his mediocre adversaries who failed to coordinate their efforts and never engaged themselves completely.

As a matter of fact, coalitions generally spring into being in war and die as soon as the armistice is concluded. However, the Holy Alliance of 140 years ago shows us an attempt at a permanent coalition, established to maintain a certain philosophical doctrine, a certain political system, and a territorial equilibrium in Europe. This alliance, concluded in Paris in 1815, between Russia, Austria, and Prussia was a mystic pact, placed under the invocation of the "Very Holy and Indivisible Trinity."

In November 1815 England joined, and in 1818 France followed. The Quintuple Alliance became—according to the liberals—a "syndicate of monarchic interests."

A real effort was made to maintain an equilibrium of power in Europe. The Congresses of Carlsbad and Vienna (1819-20) aimed at restraining liberal and national agitation in Germany. In 1821 the alliance charged Austria with the task of intervening in Italy and the reestablishment of order in Naples and Piedmont. In Verona in 1823 it was France that received the mission of acting in Spain. From that date on the syndicate became disunited, and finally, in 1824, the alliance broke up over the Greek Insurrection issue.

The Holy Alliance failed because its members had no real faith in its Christian ideal. It did not know how to oppose a superior ideology to the liberal ideas that had sprung from the French Revolution. One does not fight ideas with cannons!

Nevertheless, it must be admitted that on the material plane the alliance functioned adequately for the 12 years of its

existence. They held frequent meetings of the heads of state, determined common politics for the coalition, and applied those politics collectively wherever the system was threatened. Here, were all the elements vital to the success of a coalition in time of peace.

Since the Holy Alliance, many other coalitions have been formed, some with a view to preserving a threatened balance, as in the Crimean War, and others to strike down an aggressor. The Crimean War coalition placed emphasis on the necessity of a unified command. The victory of this coalition is interesting for several reasons, for the Crimean War is an excellent example of limited war that stayed limited. The basic reasons for the conflict were not forgotten. It is quite obvious that the seizure of Sevastopol did not signify the defeat of the immense Russian Empire. The war could have continued much longer, placing the allies, with their faraway bases and their badly organized medical and supply service, in a difficult position. But the Russian ministers wisely judged that the game was not worth the candle and preferred to renounce the protectorate of the Christian Greek element in the Ottoman Empire rather than to continue a bloody and costly war. Limited wars, characteristic of periods of equilibrium, appear to be making a comeback, for the world equilibrium of today has replaced the balance of Europe of the 19th century.

In wars of materiel, which are long drawn out and bloody and of which World War I is a prime example, the weight of economic and industrial resources finally becomes predominant. World War I was a triumph of General Fuller's theory on the capital importance of armament. But it also demonstrated the difficulties encountered by a coalition in achieving that convergence of efforts without which it loses its principal advantage. This war demonstrated the incontestable superiority of a unified command, the need for uniformity of methods of warfare, doctrine, training, and armament, and the absolute requirement for an over-all political direction and a plan that is acceptable to all.

World War II, incidentally, did not demonstrate any great progress over World War I from the viewpoint of coalitions.

This brief historical review has no other purpose than to defeat a sophism. *No, coalitions do not always triumph.* If they finally defeated Napoleon, Kaiser Wilhelm, and Hitler, they have failed before Bajazet, Louis XIV, and Frederick the Great. What are the reasons for these differences?

At present, a coalition of 15 nations has been functioning before our eyes for eight years—ample time to organize wisely, and to create and assign councils, committees, and general staffs. In the organization and the behavior of NATO, the difficulties encountered by a peacetime coalition are easily seen.

NATO

On 4 April 1949 in Washington, the representatives of 12 nations (Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom, and the United States) signed the North Atlantic Treaty.

In the preamble to the treaty, stating their collective goals, the keywords clearly were democracy, well-being, and security. These same words also can be found in all the declarations made by the signatories of the pact. The representatives of Canada, France, and Iceland insisted on security and well-being. Mr. Spaak of Belgium declared that "war is a dreadful and absurd thing that solves nothing." Denmark, Italy, Luxembourg, the Netherlands, Norway, and England emphasized the political and defensive aspect of the pact. Only Portugal and the United States

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pointed out the importance of a common ideology.

As Dean Acheson of the United States pointed out:

The truth of the treaty lies in the affirmation of the moral and spiritual values that imposed the way of life which our nations propose to lead and to defend by all possible means.

All in all, the treaty has a twofold character: not only does it establish a defensive military alliance aimed at assurance of the safety of the parties involved, but also it overlaps onto the social, economic, and cultural level. It has been said that this is a novelty, since heretofore alliances were purely military. But today, the social, financial, and national defense factors are interdependent. It would serve little purpose to have an ally who could not arm his troops because of a lack of money or industrial means, or worse still, could not instill the will to fight in his troops. This element is hardly "new." During all the Napoleonic wars, for example, England continually supported her sometimes shaky continental allies with money and propaganda.

Defense and Security

The concepts of "defense" and "security" are the motivators of the famous (and infamous) Maginot spirit. If nothing else, this leaves the best cards to the enemy, and certainly opens up the possibility of ultimate defeat.

Article 3 of the NATO Charter affirms that the parties involved should "render mutual assistance" in order to increase their individual and collective capacity to resist an armed aggression. Article 4 declares that "the parties consult every time that—in the opinion of one among them —the territorial integrity, the political independence, or the safety of one or the other of the parties is threatened." A simple consultation will suffice to decide upon an action since this action is only obligatory (article 5) in the case of an "armed attack" against one of the parties and in certain particular regions of the globe (article 6). This kind of text refers itself dangerously to a classic and outdated conception of war. Today, an "armed attack" is much too obvious a mode of action to be used openly. Unfortunately, there are a thousand other more underhanded actions that do not lend themselves to normal retaliation. According to official texts, NATO seems to relinquish the advantage of an attack to the adversary automatically, especially actions within a nation that do not constitute *armed attacks* on the territories covered by the treaty.

Neither money, men, nor communications have been spared in the attempts that have ceaselessly been made to make NATO more effective for a swift countermove against aggression during its nine years of existence. Where do we stand today? And is the functioning of the greatest coalition—at least in principle —of modern times satisfactory?

The military organization of NATO is subordinate to the "military committee" which is composed of one member of each of the signatories of NATO. This military committee, which meets but rarely, has a permanent agency in Washington, a Committee of Military Representatives, and a permanent group which comprises the representatives of France, Great Britain, and the United States. Hence, in the midst of the alliance there is a veritable military board of directors which groups the three considered countries as the most important at the moment of the signing of the treaty. The standing group is the superior agency and the two Supreme Commands—Supreme Allied Command Europe (SACEUR) and the Supreme Allied Command Atlantic (SACLANT)—are answerable to it, as are the two commanders in chief of the English Channel as well as the Canadian-American Regional Strategic Group.

The military committee of the NATO Council consists of a committee for the production of armament, an infrastructural committee, and more than 50 working groups. They already have obtained tangible results in the field of standardization of materiel. Even more important results have been obtained in the infrastructural field (airfields, telecommunications, and pipelines). But here, as elsewhere, difficulties were encountered in obtaining decisions and in speeding up administrative procedure.

NATO actually is composed of a group of sovereign allies. No decision can be made without the unanimity of all 15 members. This was not the case in the coalitions of the past, where the Council of War always made decisions on a majority basis. The system of unanimity, it must be admitted, is paralyzing. In the 20th century it is difficult to conceive an organization resembling that of the Polish Diet in the 16th century, where the *liberum veto* of only one lord sufficed to stop everything.

Also, considering NATO organization, several agencies of capital importance are missing:

1. An information agency, which is more important now than ever before when we consider the attack of the potential adversaries.

2. A central agency for scientific research for national defense, or at least an information bureau that would make it possible for everyone to profit by the work done by others.

It is lamentable to see relatively poor states spend considerable sums trying to produce that which is already in production by other members of the organization. *It is irritating* to see that the commanders in chief are as a rule very badly informed about the state of research in many of the member countries. Finally, *it is disagreeable* for certain countries to see themselves treated like second-class allies and having no access to certain military secrets which are reserved to the "elite" of the coalition.

3. A central agency for effective psychological action, whose creation is more necessary now than ever in these times of subversive warfare. Without common "idea-forces," which are spread among the masses by all available means, nothing effective can be done.

Permanent Coalitions

This brief study leads to certain generalized observations insofar as permanent coalitions are concerned.

The first of these concerns the necessity for a common faith. When men are given an aim that they believe in, they will give willingly of their sweat and their blood.

There can be no true alliance without mutual understanding and confidence. From the moment when national egotisms win over general interests, all is lost.

Confidence and understanding must bring about a definition of a commonly applicable general politics in all important cases regardless of the part of the world concerned. Recent history has certainly shown serious cases in which every nation tried to play its own game, giving the enemy a deplorable spectacle of disunity.

Finally, from a common belief must come a common social and moral philosophy. If there is agreement on fundamental principles, it becomes difficult to be in gross disagreement on their application. Moreover, if these fundamental issues were to be expressed rather than merely referred to, they would certainly gain in stature. Are we agreed as to the meaning of the "defense of the Western civilization?" And, to go to the bottom of things, are we convinced spiritualists or are we materialists with a marked Marxist tendency?

It is difficult to link fire with water. It

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is similarly difficult to act in common when the basic ideas are not the same.

Difficult but extremely important questions, such as Arabian imperialism and Asiatic "neutralism," should be the subjects of serious scrutiny, and a decision reached as to the common line of conduct to be adopted. Those countries that would not find themselves in agreement, could retire from the alliance. This certainly would be better than a hypocrisy that can only lead to deceptions and resentments.

In the military sphere action must be definite. It is a well-known fact that war is prepared in peace. The leaders must be given clear-cut missions and the means to carry them out. The commanders of NATO should be in a position to command the forces that are placed under their orders. Beginning during peace they need authority to displace and train them according to their judgment, to have a real and efficient influence on the career of their subordinates, and to have the means to make themselves obeyed at any time and with respect to all subjects without fear of immediate politization or encountering a veto.

It may not be so utopic as it sounds to think of a NATO officer corps wearing the same uniform, receiving the same pay, advancing according to the same rotation, and, if possible, receiving the same military instruction and speaking the same language.

Why not a NATO military school for the young men of all nations who wish to dedicate themselves to a military career? In this way many frictions which now lessen the efficiency of NATO could be eliminated. This would solve the irritating questions of key positions, it would avoid the too-great number of offices and officers, and finally would give the organization—at least on the military level—an *esprit de corps* and a unity of doctrine without which nothing of value can be achieved.

However this may be, one is obliged to recognize the effort which has been made by the Western allies and, if NATO shows points of weaknesses, it also has attempted to eradicate these by a fundamental revision of the intentions on which NATO is based.

Coalitions in War

Coalitions function infinitely better in times of war than of peace. However, they are slow to come to life and the present evolution of war tends to give to this speed or lack of it an increasing importance.

As early as 1939 the French and English allies had understood that the direction of the war is a political responsibility. This is the reason why Mr. Chamberlain and Mr. Daladier formed a Supreme War Council in September of that year. On 9 August 1941 Mr. Churchill and Mr. Roosevelt met somewhere in the Atlantic and, following this conference, the officers of the English and the American General Staff began to make their joint plans. On 2 January 1942 the 26 nations that were allied in the war against the Axis signed the Declaration of the United Nations, pledging themselves not to conclude any separate peace and to pursue the war with all their economic and military potentials. Parallel to this a Combined Chiefs of Staff (CCS) was created. The necessary agencies for the definition of politics and for the determination of the aims of the war of the coalition and for the convergence of the military efforts were created. Outside of the USSR the entire surface of the earth was divided into theaters of operations. In each theater where the two principal Allies had committed forces, the command was given to either an Englishman or an American with the exception of China, where, for reasons of prestige, Chiang Kai-shek remained as Generalissimo. If the chief was English, the deputy was American and vice versa. Thus Tedder was Eisenhower's deputy in Europe

and Devers was deputy to Maitland Wilson in the Mediterranean. The supreme commander had equal and total authority over all the troops of the theater, whatever their nationality. This close cooperation also could be found at all the echelons of the headquarters.

During the entire war the Anglo-American organization functioned very adequately. Political and military conferences followed one another regularly at intervals of six months. Of course, certain of the decisions that were arrived at are still debatable, especially those on the political level. It is certain that the formula of "unconditional capitulation," for example, was inauspicious in the extreme and disconcerted Hitler's German foes. The unfortunate decision of Yalta still dominates the world today. However, from the purely military viewpoint the major decision to defeat Hitler before defeating Japan was incontestably a very good decision and was adhered to almost completely. The over-all plans of the offensives were made correctly: landings in North Africa, Italy, and Europe. The regrettable rigidity of the scheme did not permit, for instance, an exploitation of the Italian victory by an amphibious operation in the Adriatic Sea, although this lack of flexibility was logistical rather than political.

Even though the Anglo-Saxon cooperation finally proved itself satisfactory, this was not true of Russian-Western cooperation. The first Interallied Conference, as a preliminary to Tehran, took place in Moscow on 17 October 1943. Roosevelt, Stalin, and Churchill were the conferees. Here is a lesson of capital importance. Whatever the organizations may be, in the end it is the men alone with all their failings and weaknesses who decide the fate of nations. The role of the great leaders, those who know how to impose their will on their partners, will never come to an end. It is the "heroes" who make history.

Thus Stalin waged "his own war" without bothering about the wishes of his allies. He knew how to exploit the dread of a separate peace—which today seems to us unthinkable—in order to demand more materiel and supplies. Putting his long-range political aims above and before the military necessities of the moment, he refused to help the Poles at Warsaw and moved his main effort to the left to "liberate" Hungary and the Balkans, when from the strategic viewpoint an attack on Berlin was mandatory. To be sure, there was cooperation, but it was a one-way proposition.

As far as Chiang Kai-shek was concerned, the checkmate was on the same order, but here the Chinese leader realized from the start that the dangerous enemy was Mao and not Hirohito. The Americans persisted in their demands that Chiang break through the blockade of Yenan and reach an understanding with Mao. This brings us to a new thought. A coalition can triumph only if it is led by men who have sound political aims, a correct estimation of events, and a proper appreciation of the "idea-forces" that animate people.

On the Axis side was the Japanese-German-Italian coalition in which Japan waged her own war without thought to the pooling of efforts and maintaining an inadmissable neutrality with the USSR. At the decisive moment Japan failed to move her submarine fleet on to the eastern coast of Africa where it could have stopped the reinforcements for Egypt and thereby changed the whole aspect of the war by bringing Hitler to the threshold of the Middle East.

In Europe, where Germany was incontestably in command and imposed her will on all her satellites, including Italy, there was an undercurrent animosity against the Nazis. Actually, other than in Germany, Hitler's ideology had not won over the masses who fought often against their

will. The Hitler coalition, after unbelievable initial success, collapsed, with the exception of Germany, because in Germany the youth had been fed the milk of Nazi doctrine.

Conclusion

Coalitions that fight against a single state are in a different situation than those opposed by another block of states. In the first instance, the often crushing superiority of means compensates for many shortcomings. In contrast thereto, in the second instance the coalition finds itself facing an adversary who has the same advantages, but who must deal with the same difficulties.

However that may be, coalitions have both defects and good qualities. They cannot be solid and their success cannot bear fruit if they are not based on a minimum of common philosophical ideas that are not only agreed upon by the leaders but also by the masses of the peoples. It is necessary to know the reason for the fight and to agree that it is worth the effort, otherwise one fights badly.

Consequently, people who no longer believe in anything but their own well-being and who seek only to assure their own "security" and living standard, run the risk of being very bad soldiers. Future war probably will not be a war of robots and scientists as was thought by some 10 years ago. It is very possible that we will have to wage limited or revolutionary wars in which the point of primary importance once again becomes the moral value of the soldier, as well as his ability to suffer and to march and live under conditions of extremely limited physical comfort. The army is called upon to play a big role in this respect. It is easy to kindle enthusiasm in the young by presenting to them a clear and truthful picture of what the West represents, of the values for which it fights, and last, what awaits if we go down in defeat.

In the second place, a coalition, especially in our time, has to be absolute. As the treaty of the Holy Alliance worded it: *the Allies must lend each other on all occasions and in all cases, assistance, aid, and succor.* There are a certain number of fundamental problems on which a complete accord must be reached, if frictions and the breaking up of the alliance is not to be risked at the most crucial moment. This necessitates, without any doubt, a spirit that is contrary to the sacred selfishness which still animates the actions of many people.

A community of ideas, total equality of the members of the alliance as far as the repartition of resources is concerned, and the sharing of secrets and information is vital. There must be complete submission to the decisions that have been arrived at by the majority, and the supreme chief must be given real power and know that he can count on the maximum effort of all the members of the pact.

The military chief of a coalition must be a superior personality, a man who is at the same time subtle and energetic, capable of impressing not only his subordinates but also the political powers that be. Energy and tenacity should outweigh subtlety.

When a coalition is formed, it implies that it foresees the possibility of a war. Therefore, it must, apart from a common faith, have war aims that are politically sound and practicable without carrying within themselves the seeds of a future war. As J. F. C. Fuller said:

Down to our days, all wars have been waged in order to establish a peace that would be more profitable than the one that has been violated.

Without putting the cart before the horse, the preparation for peace perhaps is just as important as military victory.

Delay in making political and military decisions; national selfishness that prevents the use of all resources; difficulty

in admitting the authority of one, and only one, chief; sluggish and complicated general staff procedures; debatable working methods; a lack of *esprit de corps;* jealousy among nations; and language barriers are the principal failings and shortcomings of coalitions. But they also have advantages.

First of all, they generally possess resources that are vastly superior to those of the adversary, and the extent of their territory allows for long retreats and offers them points of resistance that are difficult to subjugate.

Then, too, the diversity of talents and intellectual development permits the avoidance of formal rigidity which frequently is the generator of "thought-sclerosis." Coalitions have more freedom and thus are more productive. Finally, they have a greater number of men of merit from among whom true leaders can emerge.

By the same token, if a nation weakens or becomes discouraged, another can take up the torch and carry on the fight. It is enough to have one determined will, such as the English had in Napoleon's day, to galvanize all. In contrast to this, he who fights alone and falters, is lost.

Last, it can be said that coalitions always triumph that unite peoples who are animated by a like belief, who, having defined the common aim of a war and are assured of fraternal equality, have agreed to a "pilot-nation" and to obedience to one single leader. To put it more simply: coalitions must practice the three theological virtues: *faith, hope, and charity, adding obedience.* That is what the Arch Duke Charles—Napoleon's great enemy —expressed so admirably in his work, *The Campaign of 1799 in Switzerland:*

The idea of a common advantage, a mutual trust based on identical sentiments gives birth to coalitions. The differences of views about the ways and means to be used to attain the intended goal soon brings about division. This division increases when the events of the war displace the points of view, disappoint hopes, and change objectives. It becomes very dangerous when independent armies must act in unison for a long period of time. It is possible to count on great results from a cooperation of masses of people who are strangers to each other only in cases where necessity forces the rulers and their peoples to take up arms in order to free themselves from insufferable oppression. Even then, the decision should be reached rapidly, so that the ardor has no time to dwindle. The hope of achieving successes can also be realized when a state—through its preponderant influence —avails itself of the right to cause its opinions to prevail and imposes its will on its allies.

. . . the mutual security program identifies America with the aims and aspirations of nations seeking freedom, equality, and better conditions of life.

Secretary of State Christian A. Herter

BOOKS OF INTEREST TO THE MILITARY READER

CHANCELLORSVILLE. Lee's Greatest Battle. By General Edward J. Stackpole. 384 Pages. The Stackpole Co., Harrisburg, Pa. $5.75.

BY LT COL HAROLD E. BEATY, *CE*

On 29 April 1863 the Army of the Potomac with an approximate strength of 134,668 men, led by Major General Joseph ("Fighting Joe") Hooker crossed the Rappahannock River a few miles west of Fredericksburg, Virginia. There, near Chancellorsville, he met with General Robert E. Lee's Army of Northern Virginia, whose strength was estimated at 61,500. Here, a decisive battle was fought. On 6 May 1863 "Fighting Joe" Hooker retired his defeated forces across the Rappahannock to safety after suffering a loss of over 17,000 (13 percent). During this period the aggressive forces of Lee had an estimated loss of 12,821 (22 percent).

Two great American captains met on the field of battle with unequal forces. It was their vastly different personal characteristics and leadership abilities which dictated the conduct and outcome of this mighty engagement. One of Lee's most characteristic and endearing traits to his subordinates was a generous, self-restrained readiness to permit a wide latitude of discretion and self-determination to his unit commanders. By contrast, Hooker apparently trusted no one but himself, and even this self-confidence failed him when he was confronted with his most important decision at Chancellorsville.

The unique character of the battle area, situated in a dense forest with open country in the vicinity, furnished an interesting setting. Here, Lee achieved a definite victory against heavier odds than he had faced in previous campaigns. He fought a reorganized, reinvigorated, and confident Union Army which outnumbered his more than two to one. During this battle he lacked the support of one of his corps commanders, General Longstreet, and two divisions. Lee had only the assistance of a severely weakened cavalry force instead of powerful aggressive mounted brigades that had served him so well in the past.

Despite these handicaps, this Southern general was able to outguess, outmaneuver, and outfight his opponent at each turn after Hooker's initial success in placing his troops on Lee's rear in a surprise march at the outset of the campaign.

Throughout this well-written book the author has attempted to avoid taking sides, although the reader can sense his light regard for Hooker and admiration for Lee. General Stackpole has given excellent examples of moral and physical courage and has clearly shown their effects on the battlefield. The abundant use of contemporary engravings and photographs with carefully developed strategic and tactical maps has made this book very interesting and the narration easy to follow.

This absorbing historical book is complete within itself. It is recommended to all those who enjoy good reading, particularly to Civil War enthusiasts, historians, and military readers.

SHERMAN: Soldier—Realist—American. By B. H. Liddell Hart. 456 Pages. Frederick A. Praeger, Inc., New York. $7.50.

This book, written by one of the foremost contemporary military analysts, was published first in 1929. In the nearly 30 years since then it has become a modern biographical classic and military text.

The handsome new edition published this year brings renewed attention to a leader who can serve as a mentor for nuclear age leaders—as he did for some of the ablest World War II generals.

This book exerted a great influence on the development and employment of the German armored forces before and during World War II because of the deep impression it made on General von Blomberg and his Chief of Staff, Von Reichenau. These two jointly translated the first edition to produce a military edition for the use of German officers not long before Von Blomberg became over-all head of the three German fighting services. The book's suggestions about the application of Sherman's methods to modern mechanized forces were put into practice by both Reichenau and Guderian.

General George S. Patton, Jr., also was a keen student of the book. During World War II he told Captain Liddell Hart that he had spent a month's vacation in Georgia and the Carolinas studying Sherman's operations with this book in his hand.

From this great biography emerges the figure of a man who did not believe in war, but who, when war became inevitable, could see clearly the grand strategy and underlying military strategy that would produce the desired results in the shortest time. Sherman, the man so many considered ruthless and even wanton in his manner of conducting war, was educated, intelligent, coldly logical, and yet understanding and compassionate.

He first opposed war, then conducted it with iron severity, and, finally, seized the first opportunity to make a peace of complete absolution. In fact, he showed a great deal more understanding than the vengeful politicians who negated the just surrender terms he offered the beaten General Johnston. In Sherman's view law and war were two opposed states, and war began when law broke down. He believed that peoples make war and armies merely end it, and this is the reason he swept through the south to cut the roots of the Confederacy. It was the most logical way to end the conflict as quickly as possible.

Even with his broad grasp of war and peace and the legitimate objectives of government Sherman shunned politics, vigorously countering numerous moves to nominate him for the Presidency. However, finally in 1876 when corruption scandals blew Belknap out of the Secretary of War's chair, the new Secretary, Alphonso Taft, prevailed upon Sherman to return to Washington and command of the Army. Although limited in power and means it was General Sherman who rescued the Army from deterioration and began its educational renaissance with the foundation of the school at Fort Leavenworth in 1881.

In preparing this book the author obviously conducted painstaking research. Then, with sensitive perception for the man and his time, he analyzed General Sherman's character, leadership, tactical skill, and strategic vision. The result is a fascinating narrative that is as much an instructive history of the United States during her most troubled period as it is the absorbing story of the Civil War's outstanding military leader. Many biographies have been written about leaders who were great or near great. This one will continue to stand with the very few at the top.

MORE SINGLE-SHOT RIFLES. By James J. Grant. 322 Pages. William Morrow & Co., Inc., New York. $6.00.

XUM

THE ATOM AND THE ENERGY REVOLUTION. By Norman Lansdell. 200 Pages. The Philosophical Library, Inc., New York. $6.00.

BY LT COL GEORGE D. CARNAHAN, *OrdC*

Here is a work for the general reader who wishes to grasp the social and political implications of the new scientific breakthrough. It is valuable for the businessman who must adapt himself to the new economy, to the professional Army officer who must consider the new fields in all his planning and researching, and to the specialist in any related field of inquiry.

Some of the subjects covered are: the atom, its energy and methods of releasing it; material sources of nuclear energy; its exploitation by separate countries and by international bodies; radiation risks and insurance against them; and the impact of nuclear energy on the world as a whole.

Technological breakthroughs have been frequent in the last 20 years. The forecasts made in 1938 are repeated in light of what happened in the following 10 years. Similarly, the forecast made in 1953 makes for interesting speculation:

The fission of uranium, the peaceful piles, and the not-so-professional stockpiles are a chapter which offers little professional interest to the nuclear researcher and which he is inclined to leave to his chemical, metallurgical, and engineering colleagues. The forefront of nuclear research has moved into still higher concentrations of energy into still smaller volumes, and in doing so has again become happily impractical and remote from immediate applications, lethal or otherwise.

The author then comments to the effect that this is reminiscent of the outlook expressed in 1938, and may be nearly as quickly proved wrong.

THE BUSINESS OF WAR. The War Narrative of Major General Sir John Kennedy. Edited by Bernard Fergusson. Introduction by Walter Millis. 371 Pages. William Morrow & Co., Inc., New York. $5.00.

BY MAJ MARSHALL SANGER, *Inf*

In his preface to this book, Walter Millis says that "the Second World War, above the field level, was not fought; it was administered." The truth of this statement is most forcefully presented by Sir John Kennedy's war narrative. From his position as Director of Military Operations in the War Office, 1940-43, and as Assistant Chief of the Imperial General Staff until December 1944, General Kennedy viewed and participated in the administration of history's greatest war effort.

The difficulties of such administration were primarily of three types, those of interallied cooperation, interservice priorities, and military-political relationships. The author's frank presentation of these topics is exemplified by his comment on the problems of further landings in France as opposed to Italy and the deployment of British troops to the Pacific, rather than Indian, Ocean.

The Prime Minister comes in for several comments here, for while General Kennedy gives full credit to Mr. Churchill's greatness he does take issue with the frequent ministerial interference with the Imperial General Staff.

The fairness with which the narrative is presented is probably best expressed in the several asides, such as in the controversy over the strategy for France, where the author's hindsight is added as a parenthetical statement to his original notes, rather than as the earlier thought.

A fair, frank, calm narrative of the administration of war from the highest level of Great Britain, this book is well-recommended from that point of view.

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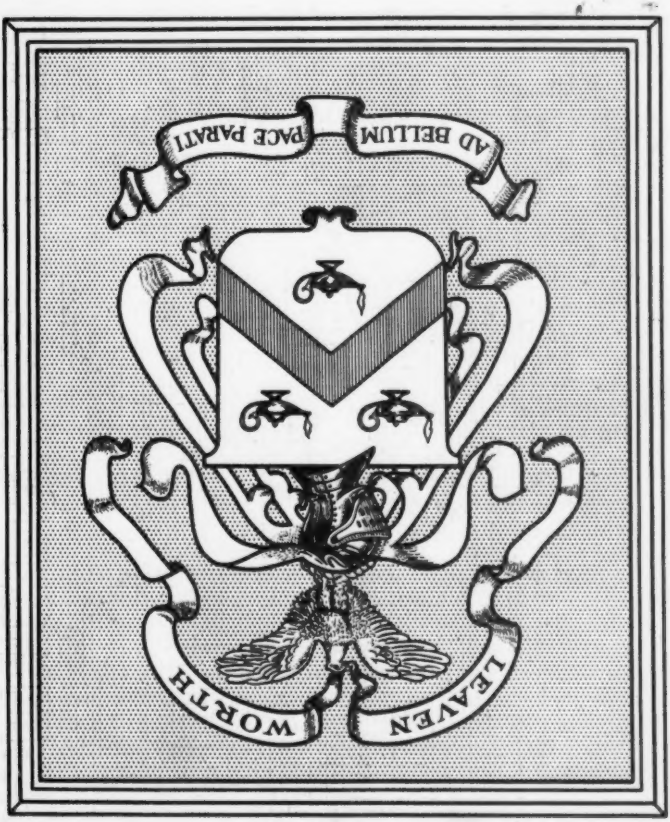

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